

JPRS 76318

27 August 1980

China Report

AGRICULTURE

No. 98



FOREIGN BROADCAST INFORMATION SERVICE

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I. GENERAL INFORMATION

STUDIES ON CROSSBREEDING GENG WITH XIAN RICE

Beijing ZHONGGUO NONGYE KEXUE [SCIENTIA AGRICULTURA SINICA], in Chinese No 2, May 80 pp 24-30

[Article by Xin Zuyi [6717 4371 7328], Li Meifang [2621 2734 5364], Wang Shumin [3769 3219 2404], He Jiaqi [0149 1367 7871] and Zhang Xiaoyan [1728 2556 3601] of the Crop Breeding and Cultivation Institute of the Chinese Agricultural Science Institute*: "Study of Crossbreeding of Xian and Geng Rice"]

[Text] We began in 1970 to conduct studies in crossbreeding xian (Indica) and geng (Japonica) rice. The purpose is to introduce the hereditary genes carrying the characteristics of resistance, short stem characteristics and rich yield characteristics from domestic and foreign xian rice varieties. The first is to increase resistance. Then heterosis of xian and geng hybrids is stabilized step by step to realize breakthroughs in producing high yield types of short stem characteristics, large panicles and large grains. The third aspect is to explore the hereditary patterns in crossbreeding of subtypes of xian and geng rice as a guide to the application of this new path in breeding.

We took the high yielding superior varieties of geng rice "jing feng No 5," "jing xi No 9," "jing xi 15," "feng jin" as backbone parents to cross with different types of xian rice varieties. The resistant carrier parents were introduced in the following four ways: (1) Domestic short xian, late geng; (2) Xian rice possessing a wide resistance spectrum and widely used internationally: such as "tadukan," "tetep"; (3) IR line selectively bred by IRRI such as "IR28," "IR1529-680-3" et al; (4) Bridging parents resistant to disease cultivated from resistant sources introduced

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from xian rice by Japan and used indirectly such as "qu shou," "Pi1-pi5," "BL7," etc. See Table 1 for details. We have cultivated "zhong zuo No 9," "zhong zuo No 75" and its sister line, "zhong zuo 121" and its sister line and No 300 restorer line by using such methods of selective breeding as triple crossing, back crossing and multiple crossing. Several major questions are reported in the following.

Table 1. Major Parents of Xian and Geng Hybrids Selected and Used

1) 亲本品种	7) 穗瘟抗性	8) 原产地	14) 类型	17) 授体亲本
Tetep	HR	9) 越	籼15)	
Tadukan	HR	10) 菲	籼	
Zenith	R	11) 美	籼	
IR1529-G80-3	R	IRRI	籼	Sigodia
IR28	R	IRRI	籼	(Tadukan TKM-6
IR26	MR	IRRI	籼	TKM-6
2) 下 北	R	日 15)	粳	Tadukan
3) 取 手 1 号	R	12) 日	粳	TKM-1
4) 取 手 2 号	R	日	粳	Co25
5) 翠 叶 青 8 号	MR	中 15)	籼	
6) 荔 枝 红	R	13) 中	粳	
BL7	R	12) 日 16)	粳	

Key:

- | | |
|--------------------------------|---------------------|
| 1) Parental varieties | 10. The Philippines |
| 2) Xia bei | 11. U.S.A. |
| 3) Qushou No 1 | 12. Japan |
| 4) Qushou No 2 | 13. China |
| 5) Zhaiyeqing No 8 | 14. Type |
| 6) Lizhihong | 15. Xian |
| 7) Resistance to blast of rice | 16. Geng |
| 8) Origin | 17. Carrier parent |
| 9) Vietnam | |

Inheritance of Economic Characteristics and the Selective Combination of the Parents

1. Fruiting Percentage of Xian and Geng Hybrids

Impregnation during the early generations of xian and geng hybrids is low, often causing difficulty for back crossing and multiple crossing. The results of the fruiting percentages of the first offspring generation for 2 years were analyzed. Impregnation of the first offspring generation of the combination of different parents is different. Impregnation is classified into three types according to the origin of the parents (Table 2).

Table 2. Analysis of the Fruiting Percentage of F1 of Xian and Geng Hybrids

1) 2)	3)	1979 年		19)	28) 1975-1976 年 (海南)		19)
		19%)	20)		19%)	20)	
4)	京丰5号/特特普	60.5	21) 特普/京丰5号	46.7	京丰5号/特特普	34.6	
5)	丰锦/塔都康	60.0	塔都康/丰锦	43.0	75-730/特特普	47.8	
6)	丰锦/特特普	59.8	塔都康/京丰8号	56.4			
7)	京丰8号/特特普	51.9					
8)	平均	58.1	平均	48.7	平均	41.2	
9)	丰锦/海南星	2.5	24) 海南星/京丰2号	2.5	京丰5号/IR26	10.2	IR26/京系17
10)	秋岭/海南星	3.2	25) 京系20	11.9	京丰5号/IR24	27.1	IR26/秋岭
11)	京丰8号/科印	33.1	科印/京丰5号	40.1	京丰5号/IR28	8.4	IR26/75-817
12)	银河/IR28	28.5	科印/京系1号	23.6	* 北光/IR28	15.0	IR28/750-1
			27)		* 秋光/IR28	15.0	IR28/75840
							IR28/京育1号
							IR28/京系15
							广陆4号/丰锦
							IR30/下北
8)	平均	16.8	平均	19.3	平均	13.7	平均
13)	中新120/昆明小白谷	91.2			罗玛/岩锦	82.6	
14)	京丰5号/PI5	95.2		37)	京育1/龙城12号	87.9	
15)	京丰5号/红红福	90.3		38)	京雄1//SiNo1/	94.0	
16)	丰锦/京丰8号	90.2			京原///龙城12号		
17)	京系3/中新120	90.8					
18)	京系3/岩梗早	82.0					
8)	平均	90.0			平均	88.2	

Key:

- | | |
|-------------------------------------|----------------------------------|
| 1. Type | 17. Jing xi 3/zhong xin 120 |
| 2. Item | 18. Jing xi 3/yan geng zao |
| 3. Names of Pedigree Crossed Groups | 19. Fruiting percentage |
| 4. Jingfeng No 5/tetep | 20. Names of Back Crossed Groups |
| 5. Feng jin/tadukan | 21. Tete/jing feng No 5 |
| 6. Feng jing/tetep | 22. Tadukin/Feng jin |
| 7. Jing feng No 8/tetep | 23. Tadukan/jing feng No 8 |
| 8. Average | 24. Hainan xing/jing fenb No 2 |
| 9. Feng jin/hainan xing | 25. Keying/jing xi 20 |
| 10. Qiu ling/hainan xing | 26. Keying/jing fenb No 5 |
| 11. Jing feng No 8/keyin | 27. Keying/jing xi No 1 |
| 12. Ying he/IR28 | 28. 1975-1976 (Hainan Island) |
| 13. Zhong xin 120/kun ming | 29. Jing feng No 5/tetep |
| 14. Jing feng No 5/PI5 | 30. 75-730/tetep |
| 15. Jing feng No 5/aihongfa | 31. Jing feng No 5/IR 26 |
| 16. Feng jin/jing feng No 8 | 32. Jing feng No 5/IR 24 |

[Key to Table 2 continuation]

33. Jing feng No 5/IR28
34. Beiguang/IR28
35. Qiuguang/IR28
36. Luoma/yanjin
37. Jing yu 1/long cheng No 12
38. Jing yue 1//St No 1/Jing yuan//long cheng No 12
39. IR26/jing xi 17
40. IR26/hong qi 16
41. IR28/jing yu No 1
42. IR28/jing xi 15
43. Guang luai No 4/feng jin
44. IR30/xia bei

Type I: The ancient xian rice varieties possessing resistant characteristics and introduced from Southeast Asia such as "tetep" and "tadukan" were used as parents. The fruiting percentages of the back crossed and pedigree crossed F₁ generations possess definite differences. The first generation offspring of the combination with geng rice as the female yields a fruiting percentage visibly higher than the back crossed combination.

Type II: Hybrid combinations with recently improved short stemmed xian rice as parents originating in South China or Southeast Asia were used. In pedigree and back crossing, the fruiting percentages of the first offspring generation were all low. The results of several years of experiments were consistent, all around 15 to 20 percent.

Type III: Hybrids among geng rice varieties were used. The fruiting percentages were generally higher, averaging above 80 to 90 percent.

It can be preliminarily seen that the trend in the fruiting percentage resulting from the use of different types of parents and different methods of selective combination has important significance in future selection of ancient xian rice from Southeast Asia with a resistance source to develop smoothly crossbreeding of xian and geng rice.

Low impregnation during the early generations is an important characteristic of xian and geng hybrids. As the number of generations increases and with artificial selection, impregnation can be increased more quickly. By means of selection of F₃ and F₄, lines and colonies of lines with high impregnation can be obtained. For example, the "3373/IR24" combination selectively combined in 1972 produced a stable plant line in the F₆ generation in 1976. In 1977, the 7th offspring generation determined and named "77-610" had a fruiting percentage of 82.4 percent. Back crossing and multiple crossing are also effective ways to raise impregnation. For example, "87-618" and "zhong zuo No 9" were back crossed once or twice or triple crossed to produce a 5th generation line with a stable fruiting percentage of between 92 and 95 percent.

2. Thousand Grain Weight and Quality of Xian and Geng Hybrids

Selective breeding practices show that raising the thousand grain weight is an important measure to increase production. Because the weight of grains is relatively less affected by the environment, large grain lines of xian and geng hybrids frequently produce high yields. Selective breeding of large grain varieties requires efforts in selective combination of the parents and selection of the later generations. "Zhongzuo No 9" has a thousand grain weight of about 29 grams, and its grains are large. This is due on the one hand to the fact that the grains of the later generations of the parents "feng jin" and "jing feng No 5/C4-63" are relatively large and on the other hand to the direction of selection of the later generations. The single plants selected among the 2nd generation hybrids of "feng jin/jing feng No 5/C4-63" have a thousand grain weight of between 24 and 32 grams. The single plants selected among the 2nd generation hybrids of "zhong zuo No 9" have a thousand grain weight of 30.4 grams. Afterwards in the F3 - F5 generations, large grain plant lines are continually selected and the large grain characteristic is thus stabilized. This illustrates the importance of selecting grain weight in the early generations. But selection of the thousand grain weight of the xian and geng hybrids is not limited to the early generations, the later generations are also important. For example, in the 4th offspring generation of the combination originating from "jing xi No 9//he jiang 18/zhai ye qing No 8," 2 plant lines of different thousand grain weights were selected. The F4 "xuan zhu 1" had a thousand grain weight of 24 grams and single plants were selected from its 22 derivatives of F5. The thousand grain weights were between 21 and 25.5 grams, 50 percent of which reached the level of the weight of grains of the parental generations. The "xuan zhu 2" of F4 had a thousand grain weight of 28 grams. Single plants were selected from its 27 derivatives of F5. The thousand grain weights were between 24 and 32.5 grams, mainly centering around 26 to 30 grams. The percentage surpassed 50 percent. The F6 plant line and the F5 are similar. The trends of the weight of grain of the parental and offspring generations of the colonies of the two lines are consistent. The thousand grain weight of "xuan zhu 1" is less than that of "xuan zhu 2." It can be seen from this that the thousand grain weight has a strong hereditary strength in separated generations. While selectively raising the thousand grain weight, attention must be given to the question of quality. Many xian rice varieties are poor in quality. The varieties of good rice quality frequently are related to the small grain characteristics of having fine long grains or short round grains. Therefore, in selecting large grain lines, selection of quality must also be considered. Large grain characteristics and good quality may be negatively correlated. Considering the present crossbreeding of xian and geng varieties, the probability of producing a plant line with a thousand grain weight of above 30 grams with a quality of grade 1 is relatively small.

3. Xian and Geng Hybrids and Selective Combination of the Parents

In crossbreeding of xian and geng rice, some of the undesirable characteristics of xian and geng rice frequently emerge, such as shattering, being tall stemmed, being of poor quality, weak resistance against cold and indeterminate separation in many later generations. How to promote the recombination of desirable characteristics in hybridization of xian and geng rice and to stabilize heterosis mainly depend upon reasonable selective combination of the parents and selection of later generations.

(1) From 1970 to 1978, over 250 combinations were made. We discovered that lines of better yields and normal fruiting percentages could be obtained earlier using high yielding and better disease resistant geng rice as the female parent to cross with xian rice, then using geng rice as the female in the F1 to F3 generations, then using later generations of the xian and geng hybrid as the male parent for back crossing. This overcomes instability of later generations of xian and geng hybrids and stabilizes xian and geng heterosis. For example, in the selective breeding of "feng jin zuo No 9" (feng jin//jing feng 5/C4-63), "zhong zuo No 75" and its sister line (jing line No 9//he jiang 18/zhai ye qing No 8), their characteristics basically stabilized in the triple crossed F4 to F5 generations. The above results seem to indicate the fruiting percentage of the offspring generations of xian and geng hybrids containing geng type cytoplasm is higher and the geng type cytoplasm may possess cultivatable genes. Therefore, selecting geng rice as the female parent has an important significance in raising the fruiting percentage.

(2) Utilizing varieties related to Taiwan's geng varieties to launch crossbreeding of xian and geng rice is an effective way to reduce the conflict between the cytoplasm of cellular and nucleic matter, overcome sterility, and promote stability of later generations. Around 1962, we utilized Taiwan's geng rice and the northern geng rice varieties to selectively breed a group of early maturing and high yielding hybrid varieties such as "jing feng No 5" etc. We discovered at the same time Taiwan's geng rice has less down, easily shatters, matures faster, its grain shape is slightly longer, and the color of its leaves is lighter. These are characteristics similar to those of xian rice. Utilizing lines related to Taiwan's geng rice as parents, such as "jing feng No 5" (Taizhong 39/shuiyuan 300 grains/nonglin 29/ tengban No 5), "703373" (Taizhong 39/shuiyuan 300 grains/baijin) for crossbreeding with xian rice showed a strong combinatory strength, the later generations had a high fruiting percentage, and the characteristics easily stabilized. Research results by IRRI, Peter, R. Jennings [sic] (1966) pointed out: Using geng rice with a xian type cytoplasm or using xian rice with a geng type cytoplasm in crossbreeding of xian and geng rice produced a 1st offspring generation with a relatively normal fruiting percentage. In the hybrid parents, Taiwan's geng rice can replace Japan's geng rice because Taiwan's geng rice possesses the cytoplasm of xian rice. Our research results are consistent with their conclusion.

(3) The use of a certain high yielding variety as the recurrent parent for crossing with a parent that is a carrier of resistant source will benefit the introduction of genes of resistance. Because we did not carry out artificial inoculations, disease inducing conditions were lacking, and also because sometimes flowering periods of Nanfan rice did not match, the back cross method often could not be carried out according to pre-determined target dates. On the other hand, we believe that without a more ideal recurrent parent, it is better to use several superior geng rice parents in step by step triple or quadruple crossings so that more disease resistant and high yielding genes can be concentrated in one new variety. The selection of parents for triple and quadruple crossings is more important than for single crossing. Otherwise all previous efforts will be wasted. For example, we separately used geng rice "xia bei" and "jing xi No 1" and IR8/the tian" in a triple cross combination, and used "xi feng" and "fu jin" and "3373/IR24" in a triple cross. The results showed that using "xia bei," "xi feng" as parents to produce the triple cross combination produces strong disease resistance, high yield characteristics and a high rate of intermediate selection, while using "jing xi No 1" and "fu jin" to produce a triple cross combination produces poor resistance to disease and the combinations had to be eliminated.

The Question of Introducing Resistant Genes

For several years we utilized xian rice and geng rice with resistance sources for crossbreeding to introduce resistant genes. The results are as follows:

1. Reaction of Xian and Geng Hybrids To Blast of Rice

The primary question in selective breeding of disease resistant varieties is to determine the resistance of the 1st generation offspring in introducing different resistance sources. In 1975, blast of rice occurred among the winter sown rice on Hainan Island. This created a favorable opportunity to determine resistance to blast of rice. Table 3 shows the reaction of the F1 combinations of parents with different resistance sources against blast of rice. Most of the 1st generation offspring of the hybrid combinations of xian rice possessing resistant sources of "tadukan" and "tetep" and geng rice showed relatively strong resistance. But most of the 1st generation offspring of hybrids of geng rice and "xia bei" and "75-1103" which possess relatively strong resistance to blast of rice and which are related to "tadukan" showed varying degrees of sensitivity to blast of rice. Their resistance is weaker than that of the 1st generation offspring produced by directly using "tadukan" as the parent. The resistance of the xian rice parents mentioned above is mostly dominant or partially dominant.

In 1979, 1,073 plant lines of the F3 to F7 generations selected 1 to 6 times in the slightly affected areas in Beijing were sent to the heavily

Table 3. Reaction of Fl of Combination of Parents of Different Resistant Sources to Blast of Rice

(1) 种	(2) 叶	(3) 花	(4) 果	(5) 根	(6) 茎	(7) 叶	(8) 花	(9) 果	(10) 根	(11) 茎	(12) 叶	(13) 花	(14) 果	(15) 根	(16) 茎	(17) 叶	(18) 花	(19) 果	(20) 根	(21) 茎	(22) 叶	(23) 花	(24) 果	(25) 根	(26) 茎	(27) 叶	(28) 花	(29) 果	(30) 根	(31) 茎	(32) 叶	(33) 花	(34) 果	(35) 根	(36) 茎	(37) 叶	(38) 花	(39) 果	(40) 根	(41) 茎	(42) 叶	(43) 花	(44) 果	(45) 根	(46) 茎	(47) 叶	(48) 花	(49) 果	(50) 根	(51) 茎	(52) 叶	(53) 花	(54) 果	(55) 根	(56) 茎	(57) 叶	(58) 花	(59) 果	(60) 根	(61) 茎	(62) 叶	(63) 花	(64) 果	(65) 根	(66) 茎	(67) 叶	(68) 花	(69) 果	(70) 根	(71) 茎	(72) 叶	(73) 花	(74) 果	(75) 根	(76) 茎	(77) 叶	(78) 花	(79) 果	(80) 根	(81) 茎	(82) 叶	(83) 花	(84) 果	(85) 根	(86) 茎	(87) 叶	(88) 花	(89) 果	(90) 根	(91) 茎	(92) 叶	(93) 花	(94) 果	(95) 根	(96) 茎	(97) 叶	(98) 花	(99) 果	(100) 根	(101) 茎	(102) 叶	(103) 花	(104) 果	(105) 根	(106) 茎	(107) 叶	(108) 花	(109) 果	(110) 根	(111) 茎	(112) 叶	(113) 花	(114) 果	(115) 根	(116) 茎	(117) 叶	(118) 花	(119) 果	(120) 根	(121) 茎	(122) 叶	(123) 花	(124) 果	(125) 根	(126) 茎	(127) 叶	(128) 花	(129) 果	(130) 根	(131) 茎	(132) 叶	(133) 花	(134) 果	(135) 根	(136) 茎	(137) 叶	(138) 花	(139) 果	(140) 根	(141) 茎	(142) 叶	(143) 花	(144) 果	(145) 根	(146) 茎	(147) 叶	(148) 花	(149) 果	(150) 根	(151) 茎	(152) 叶	(153) 花	(154) 果	(155) 根	(156) 茎	(157) 叶	(158) 花	(159) 果	(160) 根	(161) 茎	(162) 叶	(163) 花	(164) 果	(165) 根	(166) 茎	(167) 叶	(168) 花	(169) 果	(170) 根	(171) 茎	(172) 叶	(173) 花	(174) 果	(175) 根	(176) 茎	(177) 叶	(178) 花	(179) 果	(180) 根	(181) 茎	(182) 叶	(183) 花	(184) 果	(185) 根	(186) 茎	(187) 叶	(188) 花	(189) 果	(190) 根	(191) 茎	(192) 叶	(193) 花	(194) 果	(195) 根	(196) 茎	(197) 叶	(198) 花	(199) 果	(200) 根	(201) 茎	(202) 叶	(203) 花	(204) 果	(205) 根	(206) 茎	(207) 叶	(208) 花	(209) 果	(210) 根	(211) 茎	(212) 叶	(213) 花	(214) 果	(215) 根	(216) 茎	(217) 叶	(218) 花	(219) 果	(220) 根	(221) 茎	(222) 叶	(223) 花	(224) 果	(225) 根	(226) 茎	(227) 叶	(228) 花	(229) 果	(230) 根	(231) 茎	(232) 叶	(233) 花	(234) 果	(235) 根	(236) 茎	(237) 叶	(238) 花	(239) 果	(240) 根	(241) 茎	(242) 叶	(243) 花	(244) 果	(245) 根	(246) 茎	(247) 叶	(248) 花	(249) 果	(250) 根	(251) 茎	(252) 叶	(253) 花	(254) 果	(255) 根	(256) 茎	(257) 叶	(258) 花	(259) 果	(260) 根	(261) 茎	(262) 叶	(263) 花	(264) 果	(265) 根	(266) 茎	(267) 叶	(268) 花	(269) 果	(270) 根	(271) 茎	(272) 叶	(273) 花	(274) 果	(275) 根	(276) 茎	(277) 叶	(278) 花	(279) 果	(280) 根	(281) 茎	(282) 叶	(283) 花	(284) 果	(285) 根	(286) 茎	(287) 叶	(288) 花	(289) 果	(290) 根	(291) 茎	(292) 叶	(293) 花	(294) 果	(295) 根	(296) 茎	(297) 叶	(298) 花	(299) 果	(300) 根	(301) 茎	(302) 叶	(303) 花	(304) 果	(305) 根	(306) 茎	(307) 叶	(308) 花	(309) 果	(310) 根	(311) 茎	(312) 叶	(313) 花	(314) 果	(315) 根	(316) 茎	(317) 叶	(318) 花	(319) 果	(320) 根	(321) 茎	(322) 叶	(323) 花	(324) 果	(325) 根	(326) 茎	(327) 叶	(328) 花	(329) 果	(330) 根	(331) 茎	(332) 叶	(333) 花	(334) 果	(335) 根	(336) 茎	(337) 叶	(338) 花	(339) 果	(340) 根	(341) 茎	(342) 叶	(343) 花	(344) 果	(345) 根	(346) 茎	(347) 叶	(348) 花	(349) 果	(350) 根	(351) 茎	(352) 叶	(353) 花	(354) 果	(355) 根	(356) 茎	(357) 叶	(358) 花	(359) 果	(360) 根	(361) 茎	(362) 叶	(363) 花	(364) 果	(365) 根	(366) 茎	(367) 叶	(368) 花	(369) 果	(370) 根	(371) 茎	(372) 叶	(373) 花	(374) 果	(375) 根	(376) 茎	(377) 叶	(378) 花	(379) 果	(380) 根	(381) 茎	(382) 叶	(383) 花	(384) 果	(385) 根	(386) 茎	(387) 叶	(388) 花	(389) 果	(390) 根	(391) 茎	(392) 叶	(393) 花	(394) 果	(395) 根	(396) 茎	(397) 叶	(398) 花	(399) 果	(400) 根	(401) 茎	(402) 叶	(403) 花	(404) 果	(405) 根	(406) 茎	(407) 叶	(408) 花	(409) 果	(410) 根	(411) 茎	(412) 叶	(413) 花	(414) 果	(415) 根	(416) 茎	(417) 叶	(418) 花	(419) 果	(420) 根	(421) 茎	(422) 叶	(423) 花	(424) 果	(425) 根	(426) 茎	(427) 叶	(428) 花	(429) 果	(430) 根	(431) 茎	(432) 叶	(433) 花	(434) 果	(435) 根	(436) 茎	(437) 叶	(438) 花	(439) 果	(440) 根	(441) 茎	(442) 叶	(443) 花	(444) 果	(445) 根	(446) 茎	(447) 叶	(448) 花	(449) 果	(450) 根	(451) 茎	(452) 叶	(453) 花	(454) 果	(455) 根	(456) 茎	(457) 叶	(458) 花	(459) 果	(460) 根	(461) 茎	(462) 叶	(463) 花	(464) 果	(465) 根	(466) 茎	(467) 叶	(468) 花	(469) 果	(470) 根	(471) 茎	(472) 叶	(473) 花	(474) 果	(475) 根	(476) 茎	(477) 叶	(478) 花	(479) 果	(480) 根	(481) 茎	(482) 叶	(483) 花	(484) 果	(485) 根	(486) 茎	(487) 叶	(488) 花	(489) 果	(490) 根	(491) 茎	(492) 叶	(493) 花	(494) 果	(495) 根	(496) 茎	(497) 叶	(498) 花	(499) 果	(500) 根	(501) 茎	(502) 叶	(503) 花	(504) 果	(505) 根	(506) 茎	(507) 叶	(508) 花	(509) 果	(510) 根	(511) 茎	(512) 叶	(513) 花	(514) 果	(515) 根	(516) 茎	(517) 叶	(518) 花	(519) 果	(520) 根	(521) 茎	(522) 叶	(523) 花	(524) 果	(525) 根	(526) 茎	(527) 叶	(528) 花	(529) 果	(530) 根	(531) 茎	(532) 叶	(533) 花	(534) 果	(535) 根	(536) 茎	(537) 叶	(538) 花	(539) 果	(540) 根	(541) 茎	(542) 叶	(543) 花	(544) 果	(545) 根	(546) 茎	(547) 叶	(548) 花	(549) 果	(550) 根	(551) 茎	(552) 叶	(553) 花	(554) 果	(555) 根	(556) 茎	(557) 叶	(558) 花	(559) 果	(560) 根	(561) 茎	(562) 叶	(563) 花	(564) 果	(565) 根	(566) 茎	(567) 叶	(568) 花	(569) 果	(570) 根	(571) 茎	(572) 叶	(573) 花	(574) 果	(575) 根	(576) 茎	(577) 叶	(578) 花	(579) 果	(580) 根	(581) 茎	(582) 叶	(583) 花	(584) 果	(585) 根	(586) 茎	(587) 叶	(588) 花	(589) 果	(590) 根	(591) 茎	(592) 叶	(593) 花	(594) 果	(595) 根	(596) 茎	(597) 叶	(598) 花	(599) 果	(600) 根	(601) 茎	(602) 叶	(603) 花	(604) 果	(605) 根	(606) 茎	(607) 叶	(608) 花	(609) 果	(610) 根	(611) 茎	(612) 叶	(613) 花	(614) 果	(615) 根	(616) 茎	(617) 叶	(618) 花	(619) 果	(620) 根	(621) 茎	(622) 叶	(623) 花	(624) 果	(625) 根	(626) 茎	(627) 叶	(628) 花	(629) 果	(630) 根	(631) 茎	(632) 叶	(633) 花	(634) 果	(635) 根	(636) 茎	(637) 叶	(638) 花	(639) 果	(640) 根	(641) 茎	(642) 叶	(643) 花	(644) 果	(645) 根	(646) 茎	(647) 叶	(648) 花	(649) 果	(650) 根	(651) 茎	(652) 叶	(653) 花	(654) 果	(655) 根	(656) 茎	(657) 叶	(658) 花	(659) 果	(660) 根	(661) 茎	(662) 叶	(663) 花	(664) 果	(665) 根	(666) 茎	(667) 叶	(668) 花	(669) 果	(670) 根	(671) 茎	(672) 叶	(673) 花	(674) 果	(675) 根	(676) 茎	(677) 叶	(678) 花	(679) 果	(680) 根	(681) 茎	(682) 叶	(683) 花	(684) 果	(685) 根	(686) 茎	(687) 叶	(688) 花	(689) 果	(690) 根	(691) 茎	(692) 叶	(693) 花	(694) 果	(695) 根	(696) 茎	(697) 叶	(698) 花	(699) 果	(700) 根	(701) 茎	(702) 叶	(703) 花	(704) 果	(705) 根	(706) 茎	(707) 叶	(708) 花	(709) 果	(710) 根	(711) 茎	(712) 叶	(713) 花	(714) 果	(715) 根	(716) 茎	(717) 叶	(718) 花	(719) 果	(720) 根	(721) 茎	(722) 叶	(723) 花	(724) 果	(725) 根	(726) 茎	(727) 叶	(728) 花	(729) 果	(730) 根	(731) 茎	(732) 叶	(733) 花	(734) 果	(735) 根	(736) 茎	(737) 叶	(738) 花	(739) 果	(740) 根	(741) 茎	(742) 叶	(743) 花	(744) 果	(745) 根	(746) 茎	(747) 叶	(748) 花	(749) 果	(750) 根	(751) 茎	(752) 叶	(753) 花	(754) 果	(755) 根	(756) 茎	(757) 叶	(758) 花	(759) 果	(760) 根	(761) 茎	(762) 叶	(763) 花	(764) 果	(765) 根	(766) 茎	(767) 叶	(768) 花	(769) 果	(770) 根	(771) 茎	(772) 叶	(773) 花	(774) 果	(775) 根	(776) 茎	(777) 叶	(778) 花	(779) 果	(780) 根	(781) 茎	(782) 叶	(783) 花	(784) 果	(785) 根	(786) 茎	(787) 叶	(788) 花	(789) 果	(790) 根	(791) 茎	(792) 叶	(793) 花	(794) 果	(795) 根	(796) 茎	(797) 叶	(798) 花	(799) 果	(800) 根	(801) 茎	(802) 叶	(803) 花	(804) 果	(805) 根	(806) 茎	(807) 叶	(808) 花	(809) 果	(810) 根	(811) 茎	(812) 叶	(813) 花	(814) 果	(815) 根	(816) 茎	(817) 叶	(818) 花	(819) 果	(820) 根	(821) 茎	(822) 叶	(823) 花	(824) 果	(825) 根	(826) 茎	(827) 叶	(828) 花	(829) 果	(830) 根	(831) 茎	(832) 叶	(833) 花	(834) 果	(835) 根	(836) 茎	(837) 叶	(838) 花	(839) 果	(840) 根	(841) 茎	(842) 叶	(843) 花	(844) 果	(845) 根	(846) 茎	(847) 叶	(848) 花	(849) 果	(850) 根	(851) 茎	(852) 叶	(853) 花	(854) 果	(855) 根	(856) 茎	(857) 叶	(858) 花	(859) 果	(860) 根	(861) 茎	(862) 叶	(863) 花	(864) 果	(865) 根	(866) 茎	(867) 叶	(868) 花	(869) 果	(870) 根	(871) 茎	(872) 叶	(873) 花	(874) 果	(875) 根	(876) 茎	(877) 叶	(878) 花	(879) 果	(880) 根	(881) 茎	(882) 叶	(883) 花	(884) 果	(885) 根	(886) 茎	(887) 叶	(888) 花	(889) 果	(890) 根	(891) 茎	(892) 叶	(893) 花	(894) 果	(895) 根	(896) 茎	(897) 叶	(898) 花	(899) 果	(900) 根	(901) 茎	(902) 叶	(903) 花	(904) 果	(905) 根	(906) 茎	(907) 叶	(908) 花	(909) 果	(910) 根	(911) 茎	(912) 叶	(913) 花	(914) 果	(915) 根	(916) 茎	(917) 叶	(918) 花	(919) 果	(920) 根	(921) 茎	(922) 叶	(923) 花	(924) 果	(925) 根	(926) 茎	(927) 叶	(928) 花	(929) 果	(930) 根	(931) 茎	(932) 叶	(933) 花	(934) 果	(935) 根	(936) 茎	(937) 叶	(938) 花	(939) 果	(940) 根	(941) 茎	(942) 叶	(943) 花	(944) 果	(945) 根	(946) 茎	(947) 叶	(948) 花	(949) 果	(950) 根	(951) 茎	(952) 叶	(953) 花	(954) 果	(955) 根	(956) 茎	(957) 叶	(958) 花	(959) 果	(960) 根	(961) 茎	(962) 叶	(963) 花	(964) 果	(965) 根	(966) 茎	(967) 叶	(968) 花	(969) 果	(970) 根	(971) 茎	(972) 叶	(973) 花	(974) 果	(975) 根	(976) 茎	(977) 叶	(978) 花	(979) 果	(980) 根	(981) 茎	(982) 叶	(983) 花	(984) 果	(985) 根	(986) 茎	(987) 叶	(988) 花	(989) 果	(990) 根	(991) 茎	(992) 叶	(993) 花	(994) 果	(995) 根	(996) 茎	(997) 叶	(998) 花	(999) 果	(1000) 根	(1001) 茎	(1002) 叶	(1003) 花	(1004) 果	(1005) 根	(1006) 茎	(1007) 叶	(1008) 花	(1009) 果	(1010) 根	(1011) 茎	(1012) 叶	(1013) 花	(1014) 果	(1015) 根	(1016) 茎	(1017) 叶	(1018) 花	(1019) 果	(1020) 根	(1021) 茎	(1022) 叶	(1023) 花	(1024) 果	(1025) 根	(1026) 茎	(1027) 叶	(1028) 花	(1029) 果	(1030) 根	(1031) 茎	(1032) 叶	(1033) 花	(1034) 果	(1035) 根	(1036) 茎	(1037) 叶	(1038) 花	(1039) 果	(1040) 根	(1041) 茎	(1042) 叶	(1043) 花	(1044) 果	(1045) 根	(1046) 茎	(1047) 叶	(1048) 花	(1049) 果	(1050) 根	(1051) 茎	(1052) 叶	(1053) 花	(1054) 果	(1055) 根	(1056) 茎	(1057) 叶	(1058) 花	(1059) 果	(1060) 根	(1061) 茎	(1062) 叶	(1063) 花	(1064) 果	(1065) 根	(1066) 茎	(1067) 叶	(1068) 花	(1069) 果	(1070) 根	(1071) 茎	(1072) 叶	(1073) 花	(1074) 果	(1075) 根	(1076) 茎	(1077) 叶	(1078) 花	(1079) 果	(1080) 根	(1081) 茎	(1082) 叶	(1083) 花	(1084) 果	(1085) 根	(1086) 茎	(1087) 叶	(1088) 花	(1089) 果	(1090) 根	(1091) 茎	(1092) 叶	(1093) 花	(1094) 果	(1095) 根	(1096) 茎	(1097) 叶	(1098) 花	(1099) 果	(1100) 根	(1101) 茎	(1102) 叶	(1103) 花	(1104) 果	(1105) 根	(1106) 茎	(1107) 叶	(1108) 花	(1109) 果	(1110) 根	(1111) 茎	(1112) 叶	(1113) 花	(1114) 果	(1115) 根	(1116) 茎	(1117) 叶	(1118) 花	(1119) 果	(1120) 根	(1121) 茎	(1122) 叶	(1123) 花	(1124) 果
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Remark: (1) 0: No damage by spots of disease was found, 5 shows slightly damaged.
(2) This table lists all natural occurrences of diseases surveyed by the eye.
(3) The 75-1103 combination is the hybrid jing yu No 1/ tadukan

Key:

- | | |
|--------------------------|----------------------------|
| 1) 1st generation hybrid | 10) M753225/tadukan |
| 2) Name of combination | 11) 757530/tadukan |
| 3) Jing feng No 5/tetep | 12) 753088/tadukan |
| 4) 71-126/tetep | 13) Tadukan/jing jin |
| 5) Jing feng No 2/tetep | 14) Tadukan/jing feng No 7 |
| 6) Hong qi 16/tetep | 15) Tadukan/jing xi No 3 |
| 7) Feng jin/tetep | 16) Tadukan/jing feng No 8 |
| 8) Jing feng No 8/tetep | 17) Ai feng/751103 |
| 9) Qing qing/tetep | 18) Xia bei/jing xi No 3 |

[Table 3 key continuation]

19) Xiabei/jing feng No 8	31) Jing feng No 2
20) Xia bei/chang yuan 18	32) Hong qi 16
21) Xia bei/753055	33) Feng jin
22) Xia bei/754029	34) Qing qing
23) Xia bei/jing xi No 7	35) Jing feng No 8
24) Xia bei/jing xi No 17	36) Tadukan
25) Leaf blast	37) Xiabei
26) Neck blast	38) Jing feng No 7
27) Stem blast	39) Jing xi No 3
28) Parents	40) Aifeng
29) Name	41) Jing xi 17
30) Jing feng No 5	

Table 4. Results of Resistance to Blast of Rice of Parental Combinations of Different Types

1) 亲本	2) 项目	12) 系统	13) 叶 部 病 害				14) 茎 部 病 害				15) 相关性
			HR	R	M	S	HR	R	M	S	
3) 亲 本 中	110		1.45	18.00	15.45	71.80	8.18	18.18	18.1	61.03	0.8238
4) 亲 本 育	103		0	12.00	2.91	83.30	4.83	12.43	10.00	66.02	0.8718
5) 亲 本 育	43		0	4.65	0	95.35	4.65	4.65	13.98	76.74	0.8418
6) 亲 本 育	101		2.97	2.97	2.97	91.09	0	12.90	27.72	69.38	0.8423
7) 亲 本 育	92		3.26	13.04	3.26	86.44	3.26	14.13	19.22	67.39	0.8740
8) 亲 本 1 号	49		0	16.00	20.00	60.00	27.00	17.00	5.00	10.00	0.8505
9) 亲 本 2 号	22		4.65	0	4.65	90.90	4.65	9.10	4.65	81.00	0.7916
HL 7	12		0	25.00	8.33	68.67	0	25.00	0	75.00	0.8530
10) 亲 本 红	0		18.00	32.00	18.00	33.30	33.30	33.40	0	33.30	0.8848
HL129-820-3	25		4.00	8.00	8.00	80.00	0	12.00	12.00	76.00	0.8368
HL28	26		3.80	3.80	11.54	88.86	7.60	26.69	19.23	48.48	0.8174
HL26	93		1.67	2.15	0	94.78	3.23	11.83	16.13	68.81	0.7934
HL24	95		7.37	5.27	11.58	75.78	7.30	10.53	22.19	60.97	0.8449
HL8	73		0	0	0	100	1.37	5.48	6.85	86.30	0.9084
C4-53	100		0	2.00	1.00	97.00	2.00	13.00	14.00	71.00	0.8606
11) 亲 本 育	132		0	2.27	0.77	96.96	2.27	12.13	9.85	75.75	0.8709

Key:

1) Parent	9) Qushou No 2
2) Item	10) Lizihieng
3) Tadukan	11) Geng x geng
4) Tetep	12) Experimental system
5) Zenith	13) Leaf blast
6) Zhaiyeqing No 8	14) Neck blast
7) Xiabei	15) Measurement of correlation between leaf and neck blast
8) Qushou No 1	

affected area of Dongkou County in Liaoning Province in the north to determine disease resistance. The results are shown in Table 4.

Table 4 shows the following two problems:

(1) The parental combinations manifesting relatively strong resistance to leaf blast and neck blast were: "li zhi hong," "qu shou No 1" "tadukan," "IR28," "tetep" and "IR1529-680-3," "xia bei."

The parental combinations of "li zhi hong" and "qu shou No 1" were both late generation and late maturing plant lines. They were determined and selected in that diseased area, therefore the resistance of their offspring plant lines to blast of rice was relatively strong. The results of the resistance to blast of rice of "qu shou No 1" further confirmed the research results at home and abroad. The resistant gene *Pi-zt* is closely linked to late maturity. We also discovered in breeding practice that disease resistant lines can emerge from the late maturing plant line with a growth period of more than 160 days derived from the parental combination of "qu shou No 1" selectively bred in Beijing. Large numbers of early maturing lines were eliminated because of their nonresistance to blast of rice.

(2) Zenith was introduced from the United States. It is resistant to blast of rice and white leaf withering. It was used as a parent in the past. It could transfer its resistance and its offspring generations possessed large grains, good quality and good color transformation. In recent years, "zenith" and its derivative "fu jin" have shown a weakening resistance to disease. The results of determination conducted in 1979 showed most of the plant lines related to it were sensitive to blast of rice and the resistance to blast of rice has been declining.

"Xia bei" which possesses the resistant genes of *Pi-ta* and *Pi-a* has a superior resistance to disease than ordinary geng rice but the plant lines of its offspring generations are still weaker than that of the plant lines of the offspring generations of its parent "tadukan."

Ordinary parental combinations of geng rice have a weaker resistance to disease than the parental combinations of xian and geng rice possessing the resistant source and the incidences of disease are high.

2. The Relationship Between Leaf Blast and Neck Blast of Xian and Geng Hybrids

From the point of view of breeding disease resistance, the determination of resistance to blast of rice of each generation of the hybrid is very important. How to grasp it in methodology is a common problem of workers involved in breeding and plant diseases. Generally, the resistance and the sensitivity to the spotted types of leaf blast disease is clear-cut and the method of determination is simple. It is not limited by the

earliness or lateness of the period of maturation. It is easier to determine than panicle neck blast. But a question in constant debate is whether the resistance to panicle neck blast can be forecast by the resistance against leaf blast. In 1979, 1,073 plant lines of the F5 to F7 generations of the combinations of parents of different resistance to the disease were used to conduct a survey of the grades of leaf blast and neck blast and to determine their relationship and explore the nature of the relationship between leaf blast and neck blast. Determination of the combinations of 6 types of geng rice parents and 10 xian rice parents having different disease resistance mostly showed a visible correlative coefficient. This indicates that based on the grades of infection of leaf blast, the resistance to panicle neck blast can basically be estimated. When the plant is fully affected by leaf blast, selective retention of materials according to the results of leaf blast is generally reliable.

3. Reaction of Xian and Geng Hybrids to Stripe Leaf Withering

Between 1975 and 1978, disease resistance was determined in the 2 communes of Shuangqiao and Hongxing Communes in the regions heavily affected by stripe leaf withering in Beijing. We selectively used the plant lines of F3 to F8 generations of different types of parental combinations to observe resistance to stripe leaf withering. The average results after 4 years show that the geng hybrids had an infection rate of 63.8 percent. Xian and geng hybrids had an infection rate of 33.23 percent. Plant lines of the offspring generations of "tadukan" had an infection rate of 20.53 percent. Offspring generations of "64-63" had an infection rate of 35.14 percent. The incidence of disease of the plant lines of the combinations with "tadukan" as a parent was the lowest and the resistance to stripe leaf withering is stable.

Achievements of Selective Breeding

1. Cultivation of the Zhong Zuo Line

"Zhong zuo No 9" (78-308) was bred in 1975 using "feng jin" as the female and "jing feng No 5/C4-63" as the male and its permanent form was established in 1977. The line has a growth period of 150 days. It is used in Beijing as the crop following wheat, sown during the first 10 days of May, transplanted during the middle 10 days of June, and matures before the end of September. Color transformation is good. The plant type is clustered. The stem is thick. The functional leaf always stays erect. The stalk is green and the panicles are yellow. It is tolerant to fertilizers and is strongly resistant to lodging. Its thousand grain weight is between 28.5 and 29.5 grams. Its fruiting percentage is 91.3 percent. It is strongly resistant to stripe leaf withering. In 1978, its yield was the highest in the quality competition of old seedlings of rice following wheat. The yield was equivalent to a 1,081.43 jin per mu yield, an increase of 18.6 percent in yield over the contrast "jing

feng No 2." After further purification, it continued to participate in yield determination in 1979 and won first place yielding 1,035.9 jin per mu, an increase of 11.5 percent over the contrast "7508."

(2) "Zhong zuo 75" and its sister line were selectively bred in 1975 using the "jing xi No 9" as the female crossed with "he jiang No 18/zhai ye qing No 8" as a hybrid. In 1978, its performance was outstanding and was further elevated. In 1979, the 6th generation offspring lines were contrasted using single plants for transplant. They were sown on 4 May, transplanted on 10 June, and were sent simultaneously to Donggou, Qianyang and Helong areas in Liaoning Province for determination of their resistance to blast of rice. The "zhong zuo 75" is resistant to blast of rice and relatively resistant to stripe leaf withering. In 1979, it produced an equivalent of 1,224.1 jin per mu, an increase of 14.34 percent over the neighboring contrast. The number of grains per panicle was 185. The thousand grain weight was 29.1 grams. The fruiting percentage was 92.1 percent. The entire growth period is 155 days. Its sister lines "zhong zuo 79," "zhong zuo 84" and "zhong zuo 91" are all resistant to blast of rice and the yields are high.

(3) "Zhong zuo 121" and its sister line were selectively bred in 1974 using "IR1529-680-3" as the female and "jing xi 15" crossed as a hybrid. The 7th generation offspring lines were transplanted singly in 1979 and sown in 2 times. They were also sent to Donggou County in Liaoning Province for determination of their resistance to blast of rice. "Zhong zuo 121" is resistant to blast of rice and has a strong resistance to stripe leaf withering. The yield is equivalent to 1,034.5 jin per mu, an increase of 14.3 percent over the neighboring contrast. The entire growth period is 155 days. The thousand grain weight is 24 grams. The number of grains per panicle is 209. The fruiting percentage is 80.5 percent. Its sister lines "zhong zuo 120" and "zhong zuo 122" are both resistant to blast of rice and stripe leaf withering. Unit area yield is about 1,200 jin.

2. Breeding of the "Jing Xi 87-618" and Its Sister Lines

In 1973, the "jing feng No 5/tadukan" was used as the female in 2 back crossings with "li ming." The permanent form was established in the 4th generation offspring in 1976. In 1977, it was used as a rice crop following wheat and its yield was determined to be 1,005.3 jin per mu, an increase of 36.7 percent over the contrast "jing feng No 2." In 1977, it was tested at 8 localities inside Beijing. At seven localities, it produced increased yields. The yields of 6 localities were the 3rd highest, averaging an increased yield of 11.9 percent. The growth period of the line is about 130 days. In the Beijing area it can be planted as tender seedlings following wheat. Its maturation period is similar to "teng nian" and it is not very sensitive to seedling age. In 1979, it was tested by this institute. Planted as tender seedlings following wheat, it produced a per mu yield of 911.0 jin, an increase of 13.6

percent over the contrast "tong nian." It is relatively resistant to stripe leaf withering. The number of panicles is larger and the grains are large and sparse. The thousand grain weight is between 26.5 and 27 grams. The fruiting percentage is between 91.5 and 95 percent. Its sister lines "zhong zuo 13," "zhong zuo 14" and "zhong zuo 15" are strongly resistant to blast of rice (according to the results of determination of disease resistance at 9 localities in 1979), it is resistant to lodging, its yield is similar to that of "77-618," and planted as a tender seedling following wheat it has a bright future.

3. Selective Breeding of the No 300 Restorer Lines

In 1972, the line "70-3373" (Taizhong 39/shuiyuan 300 grains/bai jin) related to Taiwan's geng rice was crossed with "IR24." In the winter of 1973, the Xinjiang Agricultural Reclamation Institute took from our institute the F3 plant lines of Nanfan to test restoration. Our institute's heterosis group test produced the No 300 restorer lines from the plant lines of F4 and F5 in 1975. They are presently the restorer lines of geng rice with a strong heterosis and restorability. Therefore, via selective breeding xian and geng hybrids not only can produce high yielding and disease resistant superior varieties but can also provide superior restorer genes for use in hybridization of paddy rice.

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CSO: 4007

WINTER WHEAT VARIETIES IN NORTH CHINA CLASSIFIED

Beijing ZHONGGUO NONGYE KEXUE [SCIENTIA AGRICULTURA SINICA] in Chinese
No 2, May 80 pp 9-13

[Article by Qian Manmao [6929 2581 2021] of the Crop Variety Resources Institute of the Chinese Academy of Agricultural Science, research was conducted under the guidance of Comrade Pu Muhua [0592 1970 5478]: "Classification of the Regional Varieties of Wheat in Our Nation's Winter Wheat Regions"]

[Text] Our nation has an extensive area, and the cultivation of wheat has a long history. There are many types and varieties. The resources of the varieties are very rich. Since the founding of the nation, the party and government have paid a lot of attention to work involving the resources of crop varieties. Nationwide large-scale collections have been conducted many times. As of 1956, the former North China Agricultural Science Institute had already collected over 9,000 domestic wheat varieties. Because the materials of these varieties came from different ecological zones, some varieties were not suited for growth under Beijing's weather conditions. A nationwide meeting was held to distribute the work, and only varieties of the northern winter wheat regions are planted and preserved in Beijing. For several years, we have studied and classified over 3,000 regional varieties of winter wheat in a comprehensive way.

The geographical region included in the northern winter wheat region generally includes the region south of the Great Wall, east of Minshan, the region north of Qinling and the Huai River, and the winter wheat regions of Xinjiang, Liaoning, Jilin, and Gansu provinces. These regions are the major wheat-producing regions of our nation. The area of wheat-fields constitutes about 60 percent of our nation's total area of wheat-fields. Except for the coastal areas of this region, the climate is continental. Annual rainfall is between 300 and 750 millimeters. The amount of rainfall in the northwestern region is less. There is more rainfall in the western region. The rainfall is concentrated mostly in July and August. Spring is frequently dry and arid. In some years, autumn drought is also serious. The annual average temperature is generally between 9 and 15°C. The average temperature in January is between 0 and -8°C.

The northern border region is adjacent to the spring wheat region. Although it is cold in winter, winter wheat can still winter normally. The region of the Yellow River, Huai River, and Hai River is not very cold in winter. The green parts of the plants can basically winter, and this is the region where most of our nation's winter wheat is planted. This region can be further divided into four ecological zones according to the different latitudes, topographies, and the severity of winter temperatures.

(1) Northern ecological zone: This includes northern Hebei, northern and southeastern Shanxi, northern Shanxi, Longdong in Gansu, Jiaodong Peninsula, and the Liaodong Peninsula.

(2) The ecological zone of the plains of the Yellow and Huai rivers: This includes all of Shandong (except Jiaodong Peninsula), central and southern Hebei, central Shaanxi, southern Shanxi, most of Henan (except Xinyang, Nanyang) and Tianshui region in Gansu.

(3) Xinjiang ecological zone: This is the region in Xinjiang where winter wheat is planted.

(4) The ecological zone north of the Huai River: This includes most of the regions of Nanyang and Xinyang in Henan, and the northern regions of Jiangsu and Anhui.

In the northern winter wheat regions, the majority is ordinary wheat except for some durum wheat, poulard wheat, club wheat, and even less Poland wheat. Because of the long history of wheat cultivation in our nation, natural selection and long periods of cultivation by the laboring people over several thousands of years have created rich varieties of ordinary wheat and morphological and biological types. All of these many varieties and types have to be categorized and classified for systematic study and utilization.

How is ordinary wheat classified? Many ways have been introduced in our nation and abroad. Some methods are based on morphological characteristics and classification by mutants (such as awns, color of husk, color of grains). Some methods are based on ecological types. This is a method of classification of the characteristics formed during long periods of growth and development under definite environmental conditions. This method not only fully and comprehensively reflects the characteristics of the varieties but also is closely tied to the actual situation. We use the method of classification that combines the morphological and ecological characteristics. The uniqueness of this method mainly involves taking the form of the spikes of wheat and density of the spikes as the bases for classification. Although the form and density of the spikes of wheat are also affected by different conditions, they are relatively stable, and under ordinary conditions their change is slight. Besides the form of the spike,

the ecological type is also taken into consideration. This means the characteristics of the varieties formed at the original place of production--such as maturation period, tolerance to cold, spring and winter characteristics, tolerance to fertilizers, plant height, and mutants--are all taken into consideration for classification. These characteristics and specific natures all have important significance in the utilization and study of wheat.

The regional varieties of wheat in the northern winter wheat regions can generally be divided into three classes: the common class, the round glume and multiple flower class, and the pseudo-clustered spike class. The major characteristics of each type are described as follows:

(1) Common class: Varieties of this type are distributed most widely. Each ecological zone has its own spike form, mostly spindle shaped and of different densities. The protective glume is relatively long, and the spine of the glume is not obvious. Adaptability is strong. This type of variety is generally more tolerant to infertility and aridity and can resist other unfavorable environments. It has a relatively strong tolerance to cold, and it has a superior quality. It is not tolerant to fertilizers; the stem is soft and lodges easily. Most of these varieties are not resistant to rust disease.

(2) Round glume and multiple flower class: The protective glumes are round or oval, similar to India's short-stemmed wheat. The shoulder of the glume is wide, round, and slanted. Awnless varieties have an extremely dull tip on the glumes (almost none). Varieties with awns have mostly curled or crab-clawed outer awns. The spine of the glume visibly rises up. The spikes are small. There are many flowers, and the grains are full. The minimum number of grains formed is more than three or four grains and may reach as many as seven or eight. The stem is thick and hard. The plant is tolerant to fertilizers and water and does not lodge easily. The leaf is rather wide, and the color of the seedling is light. The varieties are mostly of a weak winter or vernal character and are not tolerant to cold. The seed grains are round or oval. The quality is rather poor. There are many red grains. To varying degrees, they are generally resistant or tolerant to stripe rust disease.

(3) Pseudo-clustered spike class: The varieties of this class have small spikes arranged in a tight cluster. They are similar to clustered wheat. The spike density is $D = 31 - 40$. The spikes are mostly oval or clavate, and the side surface is wider than the front surface. At heading time, the head of the spike extends from the side of the leaf sheath. The protective glume is egg-shaped. The shoulder is slanted. There are many flowers and many full grains. The seed grains are small and irregular.

Because the varieties and types are many and varied, using these three classes for classification cannot fully manifest the characteristics of the varieties. Therefore, under these 3 classes, we have further divided them into 18 types. The common class has 10 types, the round glume and multiple-flower class has 5 types, and the pseudo-clustered spike class has 3 types.

Each type and its ecological zone are described separately below:

I. Common Class

(1) Four types distributed in the northern ecological zone:

1. Intermediate maturing spindle spike type: This type possesses a winter or weak winter character. Part of the varieties possess a vernal character. In Beijing, normal spring sowing will enable the plant to joint or enable the single plant to head. This type is strongly tolerant to cold. In winter the young seedlings are basically green. Frost damage is at levels 1 to 2 in severity. It is outstandingly tolerant to aridity. The yield is stable when no water is sprinkled. It can adapt to many unfavorable conditions.

2. Late maturing spindle spike type: This type possesses a winter or strong winter character. Spring-sown in Beijing, the young seedlings lie completely flat on the ground surface and cannot joint. This type is late maturing or extremely late maturing. It is strongly tolerant to cold. This is an outstanding characteristic. The young seedlings can safely winter when the winter is dry and severe, there is no snow covering the ground surface, and the average temperature in January reaches -5 to -10°C . Frost damage is at level one in severity. Some varieties will not be killed by freezing, even when the absolute low temperature reaches -25°C . The young seedlings lie flat on the ground. The leaves of the seedling are dark green. The tillering ability is strong. This type is greatly affected by rust disease.

3. Jiaodong intermediate and late maturing spindle-shaped large spike type: This type possesses a winter or strong winter character. Spring-sown in Beijing, the young seedlings do not joint. The leaves of the seedling are wide and long, and their color is light green. This type is not tolerant to cold, and frost damage is at level 2 to 3 in severity. It is tolerant to fertilizers and water. The plants are tall and large. The spikes are 9 to 10 centimeters long. The plants mature rather late and are slightly affected by stripe rust disease.

4. Intermediate and late maturing spindle four-edged spike type: This type has a slightly dense spike shape, and the spikes are arranged in an orderly fashion. The width of the front and side surfaces of the spikes are equal in a four-edged spindle shape. The length of the spike is

about 7.5 centimeters. This type possesses a winter character. Spring-sown in Beijing, this type cannot joint. It is strongly tolerant to cold. Frost damage is at levels 1 to 2. The stem is strong. It is suitable for planting in medium fertile dry land. This type is affected by rust disease.

(2) The four types distributed in the ecological zone of the plains of the Yellow and Hwai rivers:

5. Early maturing spindle spike type: This type matures early or very early. It has been observed in the fields that our nation's wheat varieties planted in Beijing mature 7 to 10 days earlier than northern European wheat varieties, but this type matures even earlier. It possesses a weak winter or vernal character. Spring-sown in Beijing, the young seedlings can joint or head. Tolerance to cold is medium or medium strong. Frost damage is 2 level. Its stem is rather thin and soft, and when planted in fertile soil it lodges easily. It is more tolerant to aridity. The spike is spindle-shaped and is relatively fine and small. The spike is generally from 5.7 to 7.5 centimeters long. After heading, filling is fast. Because it matures early, it avoids rust disease and thus is only slightly affected by rust disease.

6. Intermediate and early maturing oblong spike type: The upper and lower parts of the spike are relatively symmetrical. The front surface of the spike is wider and the spike is oblong in shape. The protective glumes are also oblong and the shoulders of the glume are square. The length of the spike is about 7.5 centimeters. It possesses a weak winter character. It can joint when sown in spring. A few varieties can head. Its tolerance to cold is medium strong. Frost damage is to level 2. The stem is relatively strong, and the plant is more tolerant to fertilizers and water. There are more fruiting grains and its character for bumper harvests is good. It matures rather early. It is affected by stripe rust to a medium or slightly severe degree.

7. Intermediate maturing spindle shaped flat-headed type: The lower part of the spike is sparse and the top part is denser and larger. The side surface is wider in the shape of a flat head, like that of a duck's bill. The spike density is $D = 25-28$. The length of the spike is 6.5 to 7.5 centimeters. Most of the varieties of this type possess a weak winter character. This type has a medium or medium-strong tolerance to cold. Frost damage is at level 2. The stem is medium strong. It is affected by rust disease.

8. Intermediate maturing clustered spike type: The spikes are small and arranged densely. The spike head is not large and is spindle shaped. The density of the small spike is $D = 25 - 30$. There are many short awns. This type has many mutant colonies. Their outer appearance is very similar, but because of the different regions of their distribution, their vernal and winter character, maturation period, and tolerance to

cold are very different. This type is distributed mostly in Shandong and Henan. It generally possesses a winter or weak winter character. Its tolerance to cold is medium or medium strong. Frost damage is at level 2. Its maturation period is medium or medium late. The stem is rather soft. It is easily affected by rust disease.

(3) The varieties and types distributed in the ecological zone in Xinjiang are relatively simple and are classified into one type:

9. Extremely late maturing spindle spike type of Xinjiang: It possesses a strong winter character. If sown in spring it will not joint at all. It lies flat on the ground surface. Its tolerance to cold is medium. Frost damage is at level 2. The plant is relatively tall. Its adaptability is small. Grown in Beijing, the seed grains do not grow fully. Slightly abnormal weather conditions will cause a visible drop in the thousand grain weight. It is seriously affected by rust disease.

(4) The type distributed in the ecological zone north of the Huai River:

10. Intermediate and early maturing sparse spindle type: It possesses a weak winter or vernal character. It is not tolerant to cold. Frost damage is at level 3. It is not tolerant to aridity. Maturation period is medium or medium early. The spikes are sparse. Spike density is about $D = 17$.

II. Round Glume and Multiple Flower Class

In the northern winter wheat regions, this class is distributed mainly in the ecological zone of the plains of the Yellow and Huai rivers. There are five types:

11. Awnless spindle spike type: The outer glume is extremely bald, and there is absolutely no trace of awns. The glumes are round. Each small spike looks like a plum flower. The length of the spike is from 7 to 8 centimeters. It possesses a weak winter or vernal character. Its tolerance to cold is medium weak. Frost damage is to levels 2 to 3. Maturation period is medium. It is slightly affected by stripe rust disease or is resistant to the disease.

12. Intermediate maturing oblong spike with curly awns type: The spikes are uniformly thick from top to bottom. The spikes are oblong, and the front surface is wider. The awns are curly or hooked. There are many small spikes at the central part. More than four full grains are produced, and when conditions are appropriate, seven or eight grains may be formed. The spikes are large, and when the full spike has fruited there may be over 60 grains. The stem is relatively strong. It is inclined toward fertilizers and water, and the yield is rather high. It possesses a weak winter or vernal character. Spring-sown in Beijing, it can head. Its

tolerance to cold is medium or medium weak. Frost damage is at levels 2 to 3. It either resists or is slightly affected by stripe rust disease.

13. Clavate spike type: The spikes are dense and clavate. Spike density is $D = 33 - 38$. The protective glumes are small and round. The awns are short and curly. It possesses a vernal character. Spring-sown in Beijing, it can normally head. Its maturation period is rather early and filling is fast. Its tolerance to cold is medium and slightly weak. Frost damage is at levels 2 to 3. It is more tolerant to aridity and infertility. Its yield is low. The opening of the glumes is loose, and it shatters easily. It resists or is slightly affected by stripe rust disease.

14. Conical spike type: The upper part of the spike is smaller and the bottom part is large. Small spikes are arranged densely and uniformly in the shape of a pagoda-like cone. The protective glumes are oval. The awns are generally straight and long. It possesses a weak winter or winter character. Its tolerance to cold is medium. Frost damage is at level 2. Its maturation period is medium or medium late.

15. Branching spike type: This type is the branching type of ordinary wheat particular to our nation. It is intermediate maturing and vernal in character. Its tolerance to cold is medium to slightly weak. Frost damage is at levels 2 to 3. Its stem is rather strong and is tolerant to fertilizers and water. Under superior conditions it fully manifests its branching character. There are many full grains and the number of grains per spike can reach over 80, but the grains are relatively small.

III. Pseudo-clustered Spike Class

The spike shapes are all relatively dense in clavate or oval shape. This class includes three types distributed in different ecological zones.

16. Short-stemmed clavate spike type: It is distributed in the ecological zone of the plains of the Yellow and Huai rivers. It possesses a weak winter or vernal character. Spring-sown in Beijing, it can head normally. Some varieties can also head when sown in summer. It is not sensitive to light or temperature. Its tolerance to cold is medium. Frost damage is at level 2. It matures rather early. Filling is fast. The stem is relatively short, generally from 80 to 90 centimeters tall. It is more tolerant to fertilizers. Its adaptability is strong. It can grow in infertile dry land. The opening of the glumes is loose, and it easily shatters. It is slightly affected by stripe rust. Because it matures early, it can avoid being affected by rust disease.

17. Tall-stemmed pseudo-clustered spike type: This is distributed mainly in the northern ecological zone. It is winter in character. It cannot head at all when sown in spring. It is relatively more tolerant to cold. Frost damage is at levels 1 to 2. It matures rather late.

The stem is tall, generally about 100 centimeters. The opening of the glumes is tight, and it does not easily shatter. It is affected by rust disease.

18. Flat spike type: This is distributed mainly in the northern ecological zone along the coast of Jiaodong. It is of winter character. Its tolerance to cold is medium. Frost damage is at level 2. Its maturation period is medium to late. The stem is relatively strong, and it is relatively tolerant to fertilizers. The stem is about 100 centimeters tall.

A brief explanation and the spike shapes of the types described above are given in the accompanying table and shown in the photographs.

During the course of our efforts to comprehensively clarify the resources of wheat varieties, and through study of their classification by combining the morphological and ecological characteristics of wheat, we have encountered the following questions which are worth further exploration:

(1) In the classification of types in the past, only the external forms of the spikes and some other characteristics were used. The differences and similarities in the hereditary genes and the physiological mechanisms of the same type of varieties require further in-depth study.

(2) The branching spike type of the round glume and multiple flower class shows a better restorability in sterile lines. Observations of 200 regional varieties of wheat conducted by the former Beijing City Agricultural Science Academy's Crop Institute reveal that an absolute majority of the varieties do not have restorability. The "xiao fo shou" variety of the round glume and multiple flower class manifests restorability. Thus, attention has been given to the characteristics of the branching type of ordinary wheat.

(3) The success and utilization of the hybrid between the round glume and multiple flower type and rye have proven that our nation's round glume and multiple flower class varieties and the multiple flower and multiple fruiting pseudo-clustered spike type can easily be crossed with rye. As fertilization and irrigation conditions improve, and as the level of production is raised, more and more attention will surely be paid to the characteristics of multiple flowers and multiple grains of varieties in the selective breeding of high-yielding superior varieties. In addition, the varieties used internationally for single and absent heredity studies also belong to the round glume and multiple flower class. Therefore, the value of utilization of the round glume and multiple flower class of varieties must be further studied in depth.

(4) Some exploration is also necessary in studying the parental relationship between the two groups of the Indian short-stemmed wheat, round glume and multiple flower class, ordinary wheat, and clustered wheat, pseudo-clustered spike class, ordinary wheat.

(5) The round glume and multiple flower class and the pseudo-clustered spike class of varieties have different degrees of resistance to stripe rust disease. In 1964 severe rust disease occurred, but these 2 classes of varieties were less seriously affected than ordinary classes of varieties. Although some varieties are sensitive to the disease, the yield was not seriously affected, even after the plants were afflicted. The thousand grain weight did not drop visibly. It is worth considering whether some varieties possess horizontal resistance.

Our nation's genetic varieties and quality of wheat are rich. Ecological and morphological classification studies can be conducted utilizing these materials. Studies can also be conducted in the heredity of the heritable abilities of the characteristics, the feasibility of breeding remotely related hybrids, disease resistance, resistance to adversity, and physiological mechanisms. We have massive amounts and rich varieties and types from which we can select representative materials for widespread and in-depth determination and study.

Classification of the Types of Regional Varieties of Wheat in the Northern Winter Wheat Region

Classification	Types	Characteristics	Location of Major Distribution	Representative Varieties
Class I	1. Intermediate maturing spindle spike type	Spikes of weak winter character, relatively strong tolerance to cold, strong tolerance to acidity, adaptable to many unfavorable conditions, many white grains, not resistant to rust disease.	Northern winter wheat regions	Bai qin mai (Pingguo), xiao hong miao (Pingguo), da hong pan (Kunming)
	2. Late-maturing spindle spike type	Of winter or strong winter character, late maturing or extremely late maturing, strong tolerance to cold, many long awns and red grains, seriously affected by rust disease.	Northeast, northern Shanxi, northern Shandong, northern Shaanxi	Mao lai dong mai, shen lu dong mai, xinlan dong mai, wei bai lao mai.
	3. Standing intermediate and late maturing spindle shaped large spike type	Of winter or strong winter character, relatively tolerant to fertilizers and water, leaves are relatively wide and large, at heading time, the stem and leaves are covered with wax, slightly affected by stripe rust disease.	Standing coast	Yi xiao mao (Yanlai), er xiao shi, hai shi mai.
Class II	4. Intermediate- and late-maturing spindle shaped large spike type	Of winter character, strong tolerance to cold, many white husks, meiosis, white grain mutants, affected by rust disease.	North-central and central Hebei, Jiangdong area	Bing xiao 77, nu xiao da (Jixian), qi dou zi (Liaoyang).
	5. Early-maturing spindle spike type	Of weak winter or vernal inclined character, early maturing, tolerant to aridity, tolerant to infertile conditions, opening of glumes is loose and shatters easily, good quality, avoids rust disease.	Southern Shanxi, Shanxi, Henan	San yue hong (Kunming), xiao xiao tian (Kunming), xiao hong yu (Tianjin).
Class III	6. Intermediate and early maturing oblong spike type	Of weak winter character, relatively more solid grains, better bumper harvest characteristics, many red husks, none on tip, white grain mutants, good quality.	Southeastern and southern Shanxi, Shandong	Huang jin hong, ren tou mai (Liaoning).

7. Intermediate maturing spindle-shaped flat headed type	if weak winter character, spikes in the shape of duck's bill, many white heads, sometimes affected by rust disease.	Southern Hebei, Shandong, Henan	Ya yi red (Shandong). hai fan gu ding (Henan)
8. Intermediate maturing flattened spike type	Mostly of winter or weak winter character, spikes are shaped like clustered spinules, many short awns, white grains.	Southern Hebei, southern Shanxi, Shandong, Henan	Dong (hai) dan red. you ai ton. fu chun ban jia mian.
9. Extremely late-maturing spike type of Xinjiang	Of strong winter character, medium tolerance to cold, many long awns, red grains, poor quality, seriously affected by rust disease.	Xinjiang winter about regions	Dong dong red. hai dong red.
10. Intermediate and early maturing sparse spindle type	Of winter or vernal inclined character, plant is relatively tall and large, many red grains, poor quality.	Southern Henan, northern Jiangsu	Ma yi yan, wu sang zan.
11. Awnless spindle spike type	Of weak winter or vernal inclined char- acter, the outer glume has absolutely no trace of awns.	Henan Province	Liang guang tan, zhou ai ya.
12. Intermediate maturing oblong spike with early awns type	The type is of weak winter or vernal inclined character, the spikes are large and grains are plentiful, bumper harvest char- acter is good, many red grains, slightly affected by stripe rust disease.	Henan, Shanxi, Shandong, southern Shanxi	Ping yuan 50. chu shan hao.
13. Clavate spike type	Of vernal inclined character, matures relatively early, tolerant to infertile con- ditions, grains are round and relatively small, poor quality, slightly affected by rust disease.	Northern Hebei, Shandong, Shanxi	Zhang fei hu (Jiyuan). shou dong yang red. tu su zu (Dengxian).
14. Conical spike type	Of weak winter or winter character, spikes are small at top and large at bottom, arranged in uniform order in the shape of a pagoda, matures relatively late.	Henan, Shanxi	Zhong ping hu red. wei nan can red.

Round Climb & Multiple Flower Class	15. Branching spike type	Of vernal character, spike's branches are like Buddha's hand, relatively tol- erant to fertilizers, many white heads, seedless, red grain mutants, poor quality.	Hsuan and Shenshan area in Hsuan	Xiao fo shan (Hsuan), zi da zan nai.
Pseudo-clustered Class				
	16. Short-stemmed clavate spike type	Of weak winter or vernal inclined character, stem is relatively short, thick and strong, tolerant to fertilizer and water, slightly affected by stripe rust.	Ecological zones of the plains of the Yellow and Hwai rivers	Ma za nai, yun xi nai.
	17. Tall-stemmed pseudo- clustered spike type	Of winter character, tolerant to cold, stem is relatively tall, many long seeds, affected by rust disease.	Northern ecological zones	Ma lian dan, da tou qin.
	18. Flat spike type	Of winter character, medium tolerance to cold, stem is of medium height, minimal adaptability, many are seedless.	Hsian chun.	Hsian chun xiao nai.

INCREASED COLD STORAGE FACILITIES

OW120712 Beijing XINHUA in English 0702 GMT 12 Aug 80

[Text] Hangzhou, August 12 (XINHUA)--Three more cold storage facilities with a total capacity of 20,000 tons are to be added before the end of next year in Zhejiang Province, East China.

The construction of the new facilities, approved recently by the Ministry of Commerce, is being undertaken because of bigger supplies of pork. The number of hogs purchased for slaughter has increased by 25 percent a year for the past 4 years.

Cold stores with capacities from 500 to 5,000 tons are being constructed in Ningpo, Quxian, Huzhou and Lishui, in addition to a number of smaller ones.

Zhejiang's total cold storage capacity will reach 60,000 tons, with the new facilities almost double existing capacity. The province had only 13 cold stores of 30,000 tons in capacity in 1979.

The state raised the purchasing price of hogs last year, giving impetus to pig raising throughout China. Major pig-raising areas including the provinces of Zhejiang, Jiangsu, Shandong, Sichuan and Liaoning and the cities of Beijing, Shanghai and Tianjin as well as other places are building 430 more cold stores for meat and eggs this year. When all finished by the end of 1982, a total storage capacity of 660,000 tons will be added.

CSO: 4020

NATIONAL

NEW SEED PROCESSING PLANTS BEGIN OPERATION

OW120832 Beijing XINHUA in English 0815 GMT 12 Aug 80

[Text] Beijing, August 12 (XINHUA)--Two seed processing plants financed by the Food and Agriculture Organization of the United Nations have gone into production, the China National Seed Corporation announced today.

One plant is in Tongxian county on the outskirts of Beijing. The other is in Wuxi county of East China's Jiangsu Province. Both use equipment imported from Austria.

The construction of the projects started last October in accordance with an agreement, with the Chinese side responsible for the civil engineering and the FAO providing the funds for the equipment.

Each of the mechanized plants can process five tons of seeds per hour. The plant in Tongxian county is designed to treat maize, wheat and rice while that in Wuxi county processes rice and wheat.

Founded in 1978, the China National Seed Corporation has more than 2,000 branch companies throughout the country. In addition to providing fine seed strains, the corporation also undertakes trade and exchange of seed with other countries.

In the past year, the Chinese corporation has exported fine seed strains of soybean, hybrid sorghum, vegetable, mulberry and rice to Japan, the United States, Democratic People's Republic of Korea, Guinea and Poland. It has for the first time transferred to a U.S. company the technique of breeding hybrid rice seeds of the male-sterile, restorer and maintainer lines.

It has imported hybrid corn seed from Yugoslavia, cotton seed from the United States and apple saplings from Japan.

CSO: 4020

BRIEFS

ANHUI GRAIN PROCUREMENT--As of 3 August, summer grain procurement plans for 1980 had been overfulfilled by Xuancheng, Chaohu, Anqing, and Huizhou prefectures, by Tianchang, Chuxian, Quanjiao, Feixi, Wuhu and Tongling counties and by Huaibei, Wuhu, Maanshan, Tongling and Luan municipalities. Xuancheng prefecture increased the amount of grains put in storage by some 28 million jin over that of 1979. The amount of grains put in storage by Xuancheng, Langxi, Guangde and Nanling counties surpassed the total amount stored in 1978 and 1979. The rural areas of Huaibei municipality has put 940,000 jin of wheat in storage. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 6 Aug 80 OW]

ANHUI PREFECTURE'S CASH CROPS--Last spring Huizhou prefecture in Anhui afforested 277,000 mu of land, planted 63,000 mu of tong trees and cultivated 40,000 mu of tea-oil trees. By 30 June the prefecture had produced 238,000 dan of tea, an increase of 10,000 dan over same period last year. It also produced 11,500 dan of silkworm cocoons, an increase of 2,150 dan. Ramie output this year is expected to reach 15,000 dan, an increase of 4,000 dan. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 7 Aug 80 OW]

ANHUI COUNTY RICE CROPS--Tongcheng county of Anhui Province has stepped up rush-harvesting and rush-planting of rice crops. As of 30 July, this county had harvested 278,000 mu of early rice, and rush-planted some 198,000 mu of late autumn rice. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 5 Aug 80 OW]

ANHUI PREFECTURE AUTUMN CROPS--Fuyang prefecture of Anhui Province has stepped up efforts to replant late autumn crops in the wake of floods that hit the province since early June. Some 1 million jin of mung bean seeds and 700 dun of manure have been made available to Yingshang and Funan counties. As of present this prefecture has replanted some 1.2 million mu of late autumn crops, accounting for 70 percent of the area affected by floods. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 3 Aug 80 OW]

ANHUI COUNTY RICE CROPS--Luan county of Anhui Province makes great efforts to rush-harvest early rice and rush-plant late autumn rice in the wake of floods. As of 1 August, this county had completed harvesting early rice from 470,000 mu of rice fields, rush-planted 240,000 mu of late autumn rice and 61,000 mu of other grain crops. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 3 Aug 80 OW]

ANTIFLOOD MEASURES--Cadres and masses in Anqing and Huizhu prefectures of Anhui Province have gone all out to combat flood disaster in the past few days, rush-harvesting early rice crops and rush-planting late rice crops. In the 3 days around 1 August, rainfall reached over 200 mm in most parts of Anqing Prefecture and over 300 mm in the mountain areas of Dongzhi and Guichi counties, causing serious damage to rice crops. The damage was much more serious than that caused by three floods in June. Some 700,000 mu of early rice has not been harvested yet and nearly half the areas for late rice crops have not been planted. Efforts have been made to rush-harvest early rice crops and rush-plant late rice crops in most seriously affected areas, including Dongzhi, Guichi, Zongyang, Tongcheng, Wangjiang and Huaining counties. The rainfall reached 400 mm in mountain areas of Huizhou Prefecture and over 300 mm in Qimen, Shitai and Jixi counties. Leading comrades of Huizhou prefectural party committee and administrative office went to lead combat against flood disaster in Yixian and Xiuning counties in Huizhou Prefecture. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 6 Aug 80 OW]

CSO: 4007

BRIEFS

SUGARCANE PRODUCTION--Located at the sub-tropical zone, the climate in Fujian is moderate, moist and suitable for growing sugarcane. The areas sown to sugarcane throughout the province have reached 670,000 mu. There are also 51 mechanized and semimechanized sugar refineries in the province. The potential for developing cane sugar is very great. During the 1979-1980 refining season, 731,000 tons of sugar were produced throughout the province, for an average per mu yield of 1,107 jin of sugar. This greatly surpassed the average unit output throughout the country. The provincial CCP committee and people's government have decided to further strengthen management, gradually increase the areas sown to sugarcane, increase the output of chemical fertilizer, build 10 refineries that can each refine 2,000 tons of sugarcane daily and increase the daily refining capability by 20,000 tons. [HK060758 Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 5 Aug 80]

AGRICULTURAL FORUM--The Fujian Agricultural Department recently held a forum of agricultural experts and technical cadres to analyze the situation of the crop production this year. During the early crop production this year, the climate was abnormal with frequent disasters. However, a better harvest was reaped through the efforts of the people. The areas sown to late crops accounted for 70 percent of the whole year. In the past few years, production of late grain has been very uneven with per mu yield in some units exceeding 1,000 jin while in other units it was only 300 to 400 jin. According to an analysis by the weather departments and other units concerned, the autumn cold spell this year could arrive early with frequent typhoons and more serious insect pests. [HK140616 Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 6 Aug 80 HK]

CSO: 4007

BRIEFS

GANSU SUMMER JOBS--The broad masses in rural areas of Gansu Province are engaged in summer planting, harvesting and field management. According to recent incomplete statistics compiled by the provincial agricultural bureau, about 40 percent of the wheat has been harvested, 870,000 mu of farmland replanted with late autumn crops and 870,000 mu of farmland hoed. In 1980, 23.92 million mu of farmland in the province were sown with wheat. However, wheat production decreased substantially in the eastern part of the province owing to the drought last winter and spring. The wheat is maturing early and is rotting in the southern part of the province owing to heavy rains since the beginning of this June. Generally, however, good yields are expected. [SK311124 Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 29 Jul 80]

FINANCIAL MANAGEMENT SYMPOSIUM--The Gansu Provincial Agricultural and Forestry Bureau held a symposium in mid-July to discuss financial management and income distribution of rural communes. The symposium pointed out that the size of production teams has become smaller this year and many newly added production teams have yet to establish a sound financial system. Symposium participants contended that it is permissible to adopt different systems or methods of income distribution. They held the previously adopted punishment-and-reward systems or measures should be carried out in distributing the summer grains so as to win credibility among the peasants. [Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 29 Jul 80 SK]

VEGETATION DAMAGE--RENMIN RIBAO 27 July carried an investigative report by the Gansu Provincial Vegetation Protection Department. The report said that vegetation in many parts of the province had been seriously damaged. Take the forest in Giliashan, for instance. Reckless reclamation of lands and illegal timber cutting had damaged hundreds of thousands mu of forest in that area. There were 390,000 mu of natural shrubby forests in Dunhua County, but now they are reduced to 90,000 mu. As a result, in many areas the capacity to conserve water is declining markedly, grasslands are becoming sandy and farm output is dwindling. [Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 29 Jul 80 SK]

ENERGY SYMPOSIUM--The Gansu Provincial Agricultural and Planning Commissions recently held a joint symposium to discuss the way to gradually resolve the energy problems in rural areas. The symposium pointed out: The rural energy problem in our province is very serious and in sharp contradiction with the development of agriculture, forestry and animal husbandry. Of 74 counties which engage in agriculture across the province, 70 percent of them lack coal resource. The vast majority of people depend on firewood and dry grass for cooking and heat. Under such conditions, not only natural vegetation and grassland would be damaged but, a lot of people would be affected. To help this, the symposium held: the fundamental measure for solving rural energy problems is to go all out in planting trees and grass and in building more kindling forests. In addition, efforts should be made to plant as many high-stemmed crops as possible. [Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 30 Jul 80 SK]

CIRCULAR ON SUMMER PLOWING--The Gansu Provincial Agricultural Commission issued a circular urging rural areas throughout the province to waste no time in carrying out summer plowing. According to still incomplete statistics, the province had plowed only 840,000 mu by mid-July, a decrease of 600,000 mu over the corresponding 1979 period and 3 million mu over the corresponding 1978 period. The primary reason for this slowness is that the various localities did not pay enough attention to this work. The circular urged leading bodies at all levels to make adequate arrangements for this work to speed up summer plowing. [Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 31 Jul 80 SK]

LIVESTOCK DEVELOPMENT--Animal husbandry vigorously developed in the first half of 1980. By the end of June, the total number of sheep and hogs and the number of draught animals in stock increased 7.36 percent and 2.19 percent respectively and the number of hogs for sale increased 36.59 percent over the same period in 1979. [Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 9 Aug 80 SK]

GANSU COUNTY LIVESTOCK PRODUCTION--Beijing, 7 Aug--Tianzhu Tibetan autonomous county, Gansu, scored good results in animal husbandry for 4 years straight. The county's livestock now reaches a total of 540,000 head, hitting an all-time high record. [Beijing Xinhua Domestic Service in Chinese 0736 GMT 7 Aug 80 OW]

CSO: 4007

MEETING DISCUSSES PROBLEMS IN RAPID DEVELOPMENT OF AGRICULTURE

Guangzhou NANFANG RIBAO in Chinese 4 Jun 80 p 1

[Text] At a recent annual academic meeting of the Guangdong Provincial Agricultural Society, over 200 persons from all over the province engaged in scientific agricultural work enthusiastically discussed the question of how to quicken the pace of our province's agricultural development. Many experts considered that it is necessary to exploit fully our province's rich natural endowments, and positively and securely adjust the internal composition of agriculture, so that Guangdong may become prosperous as soon as possible.

The agriculture experts pointed out that in the past it was necessary for us to grasp fiercely the production of food grains. Some places, however, have engaged solely in food grain production without regarding the end result that forests are destroyed in order to open up land, and fishing is abandoned to reclaim land from marshes or tidal areas; or the multiple crop index was blindly raised, ruining the ecological balance. The result was the decline of cash crops, adverse effect for the development of the forestry, livestock, sideline production and fishery industries, and food grain production was not improved either. As a result, the peasants, having exhausted themselves, were still unable to become well-off.

The experts, based on our province's climatic and economic resources, raised concrete suggestions regarding the adjustment of the composition of agriculture. Everyone considered that in addition to continuing the planting of paddy rice and such food crops in various places, Shaoguan and Meixian in the north and Zhaoqing Prefecture can become prosperous solely from mountain products by developing forestry, lumber processing, small-scale hydroelectric stations, and the production of fruits, tea leaves, tea-seed oil, medicinal herbs, and tapioca, and by promoting the raising of cattle, sheep and goats, bees and deer. In our central area from east to west, where the soil is fertile and the peasants are rich in farming experience, a great effort should be made to develop sugarcane, hemp, edible oils, silk and vegetable production. Hainan island is suited for the developing rubber, timber, pepper, coconut, coffee and other tropical crops and livestock production. At the same time, it is also

necessary to fully exploit the seashore, banks and shoals to develop the aquatic products industry.

They confidently pointed out that as long as we are all of one heart, handle our affairs according to the laws of nature and economics, get a firm hold on the essential issues, and adjust in a planned way the composition of agriculture, our province's rural areas will be able to become prosperous rather quickly.

After the composition of agriculture is adjusted the proportion of land area used for planting paddy rice will be less; therefore, how can we guarantee to solve the food problem for the people of the entire province?

The experts pointed out: At present the entire province still has 17 million mu of low yielding land that produces 2-300 jin per mu in one crop and possesses great potential for increased production. A good many places are accustomed to and have experience in planting potatoes, if potatoes and such dryland grain crops are raised to the same level as paddy rice, and great efforts are made to develop the tuber processing industry in major producing areas, then the quantity of food grains produced could be increased. If grassy mountains and grassy slopes were utilized to develop livestock raising, and mountain ponds and reservoirs for the raising of fish and, in particular, getting a good hold on the raising of cattle, then the composition of the people's diet can gradually be changed and the pressure of the need for food lightened. Appropriate raises in the procurement prices of foodstuffs on which the price is negotiable should be made so that the peasants can shift the emphasis of their initiatives in increasing food production. The State conscientiously and successfully operates a number of base areas for the production of commodity foodstuffs. Of course, all this should be done while taking into account the situation as a whole and carried out in a planned way.

The experts elucidated in detail that if we want to bring into play the natural advantages of our province, then it must be from the standpoint of making a great effort to develop sugarcane, rubber, jute, sericulture, fruits and such crops, considering that if these crops are well developed it will make an important contribution to the entire country. At the same time, regarding the distribution of winter crops, that should also be done according to the principle of selecting those crops with advantages and avoiding those with disadvantages, and appropriate adjustments made.

This annual meeting was held in Guangzhou in the last 10 days of May and was the largest of any held by our province's Agricultural Society in recent years. Prof Li Peiwen [2621 3099 2429], deputy director of the Huanan College of Agriculture, and more than 10 other experts spoke at the meeting, concentrating on specialized topics. Provincial Party Committee Secretary Wang De [3769 1795] and Deputy Province Governor Ye Xuanping [0673 6693 1627] also came and spoke at the meeting. Zhang Xinyi [1728 1800 0001], the more than 80 year-old assistant director of the Chinese Agricultural Society, made a special trip to Guangzhou to participate in the meeting.

NON-STAPLE FOOD SOLD AT RURAL MARKETS RATHER THAN TO STATE

Guangzhou NANFANG RIBAO in Chinese 8 Jun 80 p 1

[Text] At present, owing to the existence of two markets and two kinds of prices, some people, because their sense of responsibility to the nation is not strong, have caused a large quantity of agricultural sideline products to enter the agricultural trade markets, while the quantity of some products that the state has been able to procure is small. For the entire province in the first quarter of this year, the quantity of agricultural sideline products procured clearly declined; the quantities of 18 varieties of important agricultural sideline products, including chickens, ducks, aquatic products, jute and bluish dogbane, procured have diminished compared with last year. But Shipai Supply and Marketing Cooperative in Puning County last year exceeded its procurement quota on agricultural sideline products, and in the first quarter of this year its actual procurement also represented a 25 percent increase over the same period last year. This achievement of Shipai Supply and Marketing Cooperative is really inspiring! Its successful experience in the work of supporting agriculture has aroused much attention.

Under the present circumstances of having two markets and two kinds of prices, how can we adapt to this change in the market to enable us to procure, by any means possible, agricultural sideline products? This is a new problem faced at present by the finance and trade departments. There are several different situations at work here: One is the slow reaction to the change in the market and, under the assault of the prices in the agricultural trade markets, [these departments] do not know how to complete the task of procurement; another situation is to raise prices at will, raising the procurement prices as well as the selling price, thus adversely affecting the stability of market prices; the third is to exert more efforts in the support of agriculture and, through arduous and painstaking ideological and organizational work, and on the basis of increasing production, guarantee the completion of the procurement plans, as the Shipai Supply and Marketing Cooperative did.

Some comrades say that after the appearance of two markets and two kinds of prices, the state policy of encouraging the selling [to the government]

of agricultural sideline products had already failed to some extent, and that it is unrealistic to expect the completion of such procurement quotas under these circumstances. This idea is worthy of discussion. True, the state policy of encouraging the selling of agricultural sideline products ought to take account of changes in the market, and should place importance on the effect of price; relevant revisions for some regulations ought to be considered; party and government departments at all levels ought to educate the peasants to strengthen their sense of responsibility to the nation and actively complete the task of turning over and selling agricultural sideline products to the state. But, there is no basis to come right out and say that, under the present circumstances, such procurement work cannot be carried out. [But] look at Shipai Supply and Marketing Cooperative: without increasing their prices, they exceeded their quota on the procurement of agricultural sideline products. One can see that the outcome of matters depends on the way one handles them; the crux still lies in whether or not we are willing to expend more efforts in supporting agriculture.

There is no denying the fact that, for present work in support of agriculture, owing to the great demand by the peasants, added to which is the influence of these external elements of changes in the market, the difficulty is even greater, and it is less easy to accomplish. Because of this, our work in support of agriculture cannot remain at the former level. It demands that we further liberate our thinking, break established regulations, and make the work of supporting agriculture more vital. We should be more realistic, increase market analyses and investigations, and bring the work of supporting agriculture up to its proper condition. We hope that the broad masses of staff and workers in commerce and in the supply and marketing system will adapt to the changed conditions as quickly as possible and, like Shipai Supply and Marketing Cooperative, in a positive way try harder to find ways to improve their procurement work.

9634

CSO: 4007

BRIEFS

CROP PROCUREMENT--Since March 1979, the grain departments in various counties and municipalities throughout Guangdong have actively done well in purchasing and marketing grain and edible oil in advance and set up warehouses for grain and edible oil. Last year, the Guangdong grain department sent out 130 persons to 20 provinces and regions to purchase grain and edible oil in advance. They also went to areas in the province where there was a surplus grain and edible oil for sale. Prices are based on supply and demand in the markets. Hainan, Zhanjiang, Huiyang, Meixian and other areas experienced drought, hailstones and floods and are short of grain. These areas have purchased 230 million jin of grain at a price 25 percent lower than the market price. [HK060748 Guangzhou Guangdong Provincial Service in Mandarin 1120 GMT 2 Aug 80]

TYPHOON DAMAGE--From 25 July to 3 August, the Guangdong work groups to the disaster affected areas visited Zhanjiang Prefecture and Hainan to obtain a clearer picture of the typhoon damage and helped the affected area resume production and rebuild their homes. Huang Jingbo, Standing Committee member of the provincial CCP committee and vice provincial governor, led the work group, which was divided into two groups. This year's Typhoon No 7 hit the province on 22 July with wind scale of 12, causing serious tidal waves and rainstorms. The tidal waves in Zhanjiang Municipality reached a maximum height of 6.5 meters, which was the highest since liberation. Some 389 large and small embankments were seriously damaged. Some 500,000 mu of farmland were also flooded. A large quantity of material and houses were also damaged. A total of 251 persons died in the typhoon, while in Hainan 21 died. [Guangzhou Guangdong Provincial Service in Mandarin 1120 GMT 6 Aug 80 HK]

PRAWN BREEDING BASES--Guangzhou, 5 Aug--Guangdong is vigorously building the prawn breeding bases on a large scale. They are run under cooperation between the state and people's communes. According to statistics, nearly 3,000 mu of the bases have been put into operation so far, and the preparing of an additional 27,000 mu is being accelerated now. All are in the province's coastal areas including Zhanjiang Municipality. [OW060025 Beijing XINHUA Domestic Service in Chinese 0115 GMT 5 Aug 80]

SOUTH CHINA UNDERGROUND FORESTS--Guangzhou, 6 Aug--Virgin forests covered by sand have been discovered in the Pearl River delta, South China. The leaves have rotted but most of the trees are still standing. The wood can still be used to make furniture, scientists of the Institute of Geography of Guangzhou said. The virgin forests, mostly mangrove and a pine (*Glyptostrobus pensilis*, K. Koch), are three meters or 20 meters below ground level in two layers. The area was submerged by the sea on two occasions, 30,000 years ago and again 2,000 years ago, scientists say. The first discovery was made in Sanshui county as local peasants were digging an irrigation project. The scientists studied the underground forest and found that it covers almost all of the Pearl River delta. [Text] [OW061103 Beijing XINHUA in English 0705 GMT 6 Aug 80]

GUANGDONG COLLEGE SOWER--Guangzhou, 4 Aug--The agricultural machinery department of the Huanan Agricultural College and its affiliated farms have successfully developed and manufactured a walking type, power-operated rice sower suitable for use in the paddy rice growing areas in South China. Operated by two men, the machine is capable of sowing 18 kilos of seeds per minute. [Beijing Xinhua Domestic Service in Chinese 0759 GMT 4 Aug 80 OW]

CS0: 4007

YANHE COUNTY HANDLES PROBLEMS IN RELAXING POLICIES

HK110149 Guiyang Guizhou Provincial Service in Mandarin 2315 GMT 10 Aug 80

[Text] In the course of implementing the provincial CCP committee's instructions on relaxing agricultural policies, a number of basic-level cadres and masses in Yanhe County had vague ideas and lacked a clear idea of the great significance and aims of relaxing the agricultural policies. As a result certain losses were caused to the collective economy. In connection with reality, the county CCP committee proposed four measures for solving this problem:

1. Cadres at all levels must emancipate their minds, act with vigor and rapidly get down to the basic levels to convey in entirety to the masses the spirit of the instructions of the central authorities and the provincial CCP committee on relaxing agricultural policies, so that the masses can thoroughly understand and grasp the policies, distinguish between right and wrong, and decide on production management measures and production team sizes to suit local conditions before the autumn harvest. Thus the normal progress of autumn cultivation can be insured.

2. In relaxing the agricultural policies it is necessary to persistently follow the socialist orientation and the principle of socialist public ownership. It is forbidden to pursue some new method contrary to this principle. It is forbidden to treat all places the same way regardless of local conditions. It is forbidden to sabotage collective property, benefit oneself at public expense, indiscriminately cut down mountain forests and sabotage forest belonging to the collective economy. It is necessary to investigate who is responsible for crimes of seriously sabotaging the collective economy.

3. It is necessary to focus attention on current production. Certain activities that hinder current production must be stopped and forces must be concentrated to promote field management.

4. Production teams where the collective economy is relatively consolidated, production develops each year, the masses' living standards rise annually,

and the standard of cadre management is relatively high must persistently follow the production management form of team or work group field operations.

The prompt and effective action taken by the county CCP committee and stabilized the masses' feelings and production order. The county has now got a good grasp of tending the autumn crops. The crops are growing well everywhere.

CSO: 4007

BEIJING STARTS JOINT ENTERPRISE TO SPUR POULTRY PRODUCTION

OW080812 Beijing XINHUA in English 0733 GMT 3 Aug 80

[Text] Beijing, August 8 (XINHUA)--A joint enterprise that covers poultry and rabbit breeding, processing and sales has been just set up here by the General Bureau of Animal Husbandry of the Ministry of Agriculture, the Beijing Municipal Animal Husbandry Bureau and suburban people's communes and production brigades. The aim is to supply the capital with more poultry, eggs and meat. Within 3 years there are to be three seed chicken and turkey farms, a seed rabbit farm, a slaughterhouse and a honey processing plant.

The General Bureau of Animal Husbandry and the municipal bureau will provide the investment of 21 million yuan. Production techniques will be supplied by the municipal bureau. The communes and brigades will provide land within their boundaries and work force on the farms and in processing plants. Communes and brigades will raise chickens, turkeys and rabbits on contract with the enterprise. The enterprise will provide them with fodder and technique and disease preventive measures. After the rabbits and chickens are mature, the communes and brigades will sell them to the enterprise.

Units under the enterprise will assume sole responsibility for profits or losses. The enterprise will sell the products directly in shops it is to build in the city.

CSO: 4020

BRIEFS

OIL-BEARING CROP PRODUCTION--Hebei Province has made headway in oil-bearing crop production this year as a result of its efforts to conscientiously implement the party's economic policies. According to incomplete statistics, the province has planted 6.35 million mu of oil-bearing crops. This figure tops that of last year by 600,000 mu. Among crops planted this year are 3 million mu of peanuts. [OW131243 Beijing Domestic Service in Mandarin 0400 GMT 10 Aug 80]

BEIJING INTEGRATED COMPANY--Beijing, 7 Aug--The Huadu Animal Husbandry, Industry and Commerce Integrated Company was set up recently in Beijing with joint investments from the Animal Husbandry Bureau under the Ministry of Agriculture, the Beijing Municipal Animal Husbandry Bureau and from communes on the outskirts of Beijing. The company aims at better meeting the capital's demand for livestock and poultry by increasing output and reducing supply procedures. By signing contracts, it won the participation of a number of enterprises and undertakings of various ownership systems as well as that of the communes. All participating units will assume sole responsibility for their respective profits and losses. Profits, if any, will be distributed proportionately among investors according to their investments. [Beijing XINHUA Domestic Service in Chinese 0206 GMT 7 Aug 80 OW]

HEBEI COUNTY WOOL OUTPUT--Beijing, 7 Aug--Weichang county, Hebei, increased sheep's wool output this year. It procured a total of 1.4 million jin of wool, overfulfilling the annual procurement plan by 11 percent and topping last year by 10 percent. [Beijing Xinhua Domestic Service in Chinese 0736 GMT 7 Aug 80 OW]

HEBEI COUNTY SHEEP OUTPUT--Beijing, 7 Aug--In the first half of this year, Cangxian county, Hebei, kept in pens a total of 92,000 head of sheep, topping the corresponding period last year by 52.6 percent. It also turned over 100,000 pieces of sheepskin to the higher authorities, overfulfilling the mission by 100 percent. [Beijing Xinhua Domestic Service in Chinese 0736 GMT 7 Aug 80 OW]

BRIEFS

AGRICULTURAL ECONOMY SOCIETY--The Heilongjiang Provincial Agricultural Economy Society held its inaugural meeting 9 August. Deputy Governor Wang Caoli attended. [SK130828 Harbin Heilongjiang Provincial Service in Mandarin 2200 GMT 9 Aug 80]

FORESTRY TECHNICAL CLASS--The Northeast Forestry College in Heilongjiang Province has recently opened a training class on forest pedology, as delegated by the Ministry of Forestry. A class opening ceremony was held on 4 August. Attending the class were 45 forestry specialists from Heilongjiang, Jilin, Liaoning, Shanxi, Shaanxi, Hebei, Gansu, Sichuan, Yunnan and Qinghai provinces, as well as from Ningxia, Xinjiang and Nei Monggol autonomous regions. Nearly 30 forestry and pedological professors and experts from the Northeast Forestry College, the Shenyang Agricultural College, the Northeast Agricultural College and from the Forest Soil Institute of China Academy of Sciences are responsible for the class lectures. This class will produce some backbone personnel for the second national general survey of forest soil. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 4 Aug 80 SK]

IRRIGATION PROJECTS--The Nenjiang water diversion project and the (Lianhuan) Lake water-supply project simultaneously staged a test-run 1 August in the southern area of Heilongjiang Province. The Nenjiang water diversion project consists of three parts--water diversion, water conservation and irrigation--spanning Dorbod Mongol Autonomous County, Daqing Municipality and Zhaoyuan County. the first two parts have been completed and construction will start next year on the third part. The entire project will be completed in 1982. By then, 470,000 mu of farmland will be irrigated, 1.34 million mu of grasslands will be watered, 270,000 mu of water surfaces will be used to plant reeds and 200,000 mu to breed aquatics. (Lianhuan) Lake in Dorbod County, once teeming with aquatics, has dried up in recent years. The (Lianhuan) Lake water-supply project aiming at channeling enough water into the lake has begun and will be completed next year. [Harbin Heilongjiang Provincial Service in Mandarin 2200 GMT 1 Aug 80 SK]

DROUGHT REPORTED--The Heilongjiang Provincial Party Committee and People's Government issued an emergency circular 7 August calling for efforts to fight heat and drought throughout the province. Since 23 July there has been high temperatures and no rain in most areas. According to weather departments, the heat and drought will worsen in early August. [SK100119 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 8 Aug 80]

CATTLE ARTIFICIAL INSEMINATION CENTER--Harbin, 11 Aug--Construction of the Heilongjiang Provincial Cattle Artificial Insemination Center, China's biggest, was recently completed on the outskirts of Harbin, capital of the province. It is also planned to be a center for providing technical guidance in cattle artificial insemination in the province. The center has 70 bulls of a fine Chinese breed and several foreign breeds imported from France and other countries and is fitted out with modern equipment to produce frozen semen for the breeding of beef cattle and milch cows. Heilongjiang has more than 3.3 million hectares of grassland and over a million head of cattle. It is China's top producer of dairy products, accounting for one-fourth of the country's total. [Text] [OW111607 Beijing XINHUA in English 1220 GMT 11 Aug 80 OW]

LAND RECLAMATION--Harbin, 4 Aug--The people's communes in Heilongjiang reclaimed more than 800,000 mu of waste land in the first half of 1980, half of which have already been planted to spring soybeans and wheat. The province presently has 120 million mu of arable land. As determined by state and provincial scientific research agencies after survey, there are 50 million mu of reclamable land in the Heilongjiang River Valley and the Sanjiang Plain. To expedite reclamation, 69 mechanized reclamation centers have been set up this year in addition to the 86 set up last year. [OW060025 Beijing XINHUA Domestic Service in Chinese 0703 GMT 4 Aug 80] Harbin, 4 Aug--Since the beginning of 1980, the Heilongjiang State Farm General Administration has reclaimed 610,000 mu of waste land, of which 250,000 mu have been planted to spring soybeans. At present the administration is working out a 1981-85 land reclamation plan for reclaiming another 10 million mu in 5 years. [OW060025 Beijing XINHUA Domestic Service in Chinese 0748 GMT 4 Aug 80]

CATTLE BREEDING--Heilongjiang Province has plans to breed some 250,000 head of fine strain cattle. Breeding work is now vigorously underway throughout the province. By the end of July the province bred more than 97,000 head of cattle, an increase of 18.9 percent over that of the corresponding 1979 period, of which about 60,000 head were bred by means of frozen sperm. There were about 118,000 calves in the province by the end of July, an increase of more than 30,000 head and 54 percent more than the year before. This has rarely been seen in Heilongjiang Province over the past 10 years or so. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 3 Aug 80 SK]

DAIRY HERDS INCREASE--The number of dairy cows in Heilongjiang has increased rapidly. As of 30 June, there were some 74,000 head, showing an increase of more than 13 percent over the same period last year. With the increase of dairy cows, there is an amply supply of fresh milk in the province. [Beijing Domestic Service in Mandarin 0400 GMT 5 Aug 80 OW]

CSO: 4007

HUBEI

BRIEFS

RURAL DISASTER LOANS--Since the flood season this year, rainstorms have occurred frequently in Hubei. Many areas experienced floods and water-logging. The people suffered very great losses in agricultural production. After the occurrence of the disasters, the party organization of the Hubei Agricultural Bank sent telegrams to the banks in the prefectures and municipalities, requesting that they try to provide funds to support agricultural production. The departments for supporting agriculture in the affected areas have immediately gone to the first line of resisting disasters to formulate relief plans. Since mid-June, Jingzhou, Huanggan, Xiaogan and Yichang prefectures have provided 50.97 million yuan in loans. The provincial branch bank has also provided 9 million yuan in reserve funds for the communes and brigades where the disasters were serious and there is a shortage of funds. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 5 Aug 80 HK]

CSO: 4007

JIANGSU

BRIEFS

JIANGSU COUNTY COTTON MANAGEMENT--Since the beginning of this year Siyang county in Jiangsu Province has vigorously carried out field management of cotton field. The county's 290,000 mu of cotton is now growing well. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 7 Aug 80 OW]

JIANGSU COUNTY GRAIN OUTPUT--Kunshan county of Jiangsu Province has 800,000 mu of grain fields and turned in to the state some 500 million jin of grains in 1979. The county's wheat output this year increased by 5 million jin over that of 1979. The growth of rice crops has been affected by long rains and efforts are being made to strengthen field management of rice fields so as to win bumper harvest. [Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 9 Aug 80 OW]

AQUATIC PRODUCTS--Jiangsu Province harvested a total of 110,000 tons of aquatic products from sea and breeding waters during the spring and summer seasons, topping the same period last year by over 13 percent. The total fishing output value and profits also registered large increases. Early last spring party committees at all levels in Jiangsu's fishing areas readjusted the procurement ratio of fishery products and implemented various fishery policies. These steps have fired the fishermen's production enthusiasm and insured a big harvest for the province. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 4 Aug 80 OW]

CSO: 4007

LIAOHE PLAIN MARKETABLE GRAIN BASE BUILT UP

OW121425 Beijing XINHUA Domestic Service in Chinese 0736 GMT 12 Aug 80

[Excerpts] Shenyang, 12 Aug--The Liaoning Provincial CCP Committee has taken positive measures to speed building the Liaohe River Plain into a marketable grain base.

The Liaohe River Plain marketable grain base is located on both banks of Liaohe River, stretching from Changtu County in the north to Liaodong Gulf in the south. It encompasses 17 counties (districts) including Changtu, Taiyuan, Tieling, Faku, Liaozhong, Xinmin, Taian, Haicheng, Heishan, Jin, Liaoyang, Dengta, Yingkou, Panshan, Dawa, Xinchengzi and Sujiatun. Liaohe River and its tributaries Hunhe, Taizihe and Raoyanghe run through this area.

The area produces a lot of corn, sorghum, rice, soybeans and many kinds of industrial crops. It has an agricultural population of 8.15 million, 35 percent of the total agricultural population of the province; and 22.85 million mu of land under cultivation, 36.4 percent of the provincial total. Last year the total output of grain and soybeans of the 17 counties (districts) was 11.45 billion jin, 47.9 percent of the total grain output of the province; and 4.58 billion jin of marketable grain and soybeans was sold to the state, 62.5 percent of the total sold by the province. The proportion of marketable grain was as high as 40 percent. Last year the area's per capita income derived from collectives was 125 yuan, higher than the provincial per capita income.

To speed up this area's production and construction so as to provide more grain and soybeans to the state, the provincial party committee has decided that the area's construction should embody the policy of taking grain as the key link and insuring an all-round development, and that its total grain and soybean output should be increased by increasing per-mu grain and soybean output. At the same time oil-bearing crops, livestock, fowl and aquatic production, afforestation and commune and brigade enterprises should be developed, closely combining vigorous development of grain production with development of a diversified economy, and taking the road of all-round development of farming, forestry, animal husbandry, sideline production and fishery and integration of agriculture, industry and commerce.

The area's frost-free period is short. Low temperatures and frostbite cause serious damages to agriculture. To insure increased output and income, the provincial party committee has decided to vigorously develop mechanization in this area to carry out cultivation and field management in good time and avoid frostbite. At the same time, the large amounts of manpower and draft animals thus relieved will be used to develop a diversified economy.

CSO: 4007

BRIEFS

INSPECTION GROUP FORMED --Liaoning Province recently formed an agricultural science and technology inspection group with several sub-groups to carry out separate comprehensive agricultural science and technology inspections in the central, western and eastern parts of the province. On 10 August the second sub-group started its inspection work in various localities in Liaoyang Municipality. The first sub-group will start its work in Anshan areas on 11 August. The Liaoning Provincial CCP Committee and the provincial government have paid great attention to this work and urged the province scientific and technological committee and other departments concerned to do a good job in organizing these inspections. The main inspection group is headed by Zhang Zhiyuan, provincial deputy governor. The deputy leaders are principal responsible comrades of the provincial agricultural college, the provincial academy of agricultural sciences, the provincial scientific and technological committee, the provincial agricultural office and the provincial science association, including Chen Enfeng, (Cao Yuchun), (Yan Cunlin), (Lei Jiefu) and (Yun Zhencao). [Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 10 Aug 80 SK]

URBAN VEGETABLE MARKET--Shenyang, 10 Aug--Vegetable stores in Shenyang, Luda, Anshan and seven other cities in Liaoning are filled with customers this summer, thanks to the bumper harvest of summer vegetables in the suburbs of the 10 cities. In July urban dwellers in Liaoning could have an average of 1.5 jin of vegetables per capita daily. [Beijing XINHUA Domestic Service in Chinese 0135 GMT 10 Aug 80 OW]

HAILSTORM REPORTED--A hailstorm wreaked havoc in Tai'an County on the night of 21 July. Nearly 100,000 mu of land suffered damages. The county party committee decided to appropriate 60,000 yuan relief funds to the communes and brigades that were hit by the hailstorm. [Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 6 Aug 80 SK]

CSO: 4007

BRIEFS

NEI MONGGOL ARTESIAN BASINS--Hohhot, 29 Jul--A certain unit under the PLA capital construction engineer corps recently initially proved 15 large-size basins with artesian water in a desert area in west Nei Monggol. According to the concerned departments, the discovery of them provides good prospects for transforming the desert to facilitate the development of animal husbandry. Among the basins, Jilantai [0679 5695 3141] basin is the largest one, covering about 15,900 square km. Its area of artesian water totals about 5,000 square km. [OW301417 Beijing XINHUA Domestic Service in Chinese 0117 GMT 29 Jul 80]

CSO: 4007

BRIEFS

COMMUNE MANAGEMENT MEETING--(Haidong) Prefecture recently held a meeting at (Datao) commune in Huangzhong County with the participation of personnel in charge of people's commune management to discuss ways of putting specialists in charge of rural accounting work. (Datao) commune in Huangzhong County was assigned to begin experimental work of specializing accounting work in the first half of 1980 and made progress in this regard, at which point the prefecture held a meeting to have people listen to the experiences gained by the commune and to share knowledge of their experience with others. Comrade Xu Linfeng, standing committee member of the provincial CCP committee and secretary of the Xining Municipal CCP Committee, attended and addressed the meeting. In his speech he called on participating comrades from (Haidong) prefectural organs and from various counties to adopt measures suitable to their local conditions and to put specialists in charge of accounting work. [Xining Qinghai Provincial Service in Mandarin 2330 GMT 30 Jul 80 SK]

CSO: 4007

BRIEFS

SHAANXI VETERINARY MEDICINE BOOK--Xian, 8 Aug--Veterinarian Li Decheng of Hanzhong county, Shaanxi Province, has written a book summing up his decades of clinical experience. The book has three parts--diagnosis, treatment and medicines. The first part deals with basic theory of traditional veterinary medicine, the second reports on the treatment of 168 common diseases of domestic animals and poultry while the third discusses 256 herbal medicines in common use. The book will soon be published by the Shaanxi Provincial Science and Technology Publishing House. Sixty-six-year-old Li Decheng is guest research fellow of the Northwest China Institute of Livestock Breeding and Veterinary Science under the Chinese Academy of Agricultural Sciences. He studied under his father and began his career at the age of 20. [Text] [OW081315 Beijing XINHUA in English 0703 GMT 8 Aug 80]

MAJOR PRODUCER OF DAIRY PRODUCTS--Shaanxi Province, Northwest China, has become one of the major producers of dairy products in China, following the raising of more milk goats by local peasant families. It produced 2,400 tons of milk powder in the first half of this year, 50 percent more than in the same period of last year. [Beijing XINHUA in English 0704 GMT 1 Aug 80 OW]

CSO: 4020

SHANDONG

BRIEFS

PEANUT PRODUCTION IN SHANDONG--Jiaonan county, Shandong, planted 240,000 mu of peanuts this year. Judged from the crops' growth, a bumper harvest is expected. [Beijing Domestic Service in Mandarin 0400 GMT 5 Aug 80 OW]

CSO: 4007

VARIETY CHARACTERISTICS, PLANTING TIMETABLES REPORTED

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Shanghai NONGYE SHENGCHAN JISHU SHOUCE [HANDBOOK ON AGRICULTURAL PRODUCTION TECHNIQUES FOR SHANGHAI] in Chinese Apr 79 pp 1-13

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Planting Time-tables

Shanghai Native SOWERMAN FARM SYSTEM [REPRODUCED FOR AGRICULTURAL PRODUCTION INFORMATION FOR CHINA] IN CHINA, APR 20, 1931

Table 2-5 Planting Times for Paddy Rice

Variety	Sowing Period	Quantity of seeds per mu (1/15 of clem unhusked rice)	Transplanting Period	Seedling Age (days)	Tillering Period	Heading Period	Time of ripening	Period of growth (days)
Early rice following green manure crop	End March to 15 April	200 - 400	End April to first 10 days of May	20 - 30	Mid 10 days of May to first 10 days of June	Last 10 days of June to first 10 days of July	Last 10 days of July	105 - 120
Three crop system	15 April to early May	120 - 200	20 May to 5 June	25 - 45	Last 10 days of May to mid 10 days of June	Early July to 15 July	End July to first 10 days of August	95 - 110
Late season rice	Mid 10 days of June to 5 July	120 - 180	End July to 10 August	35 - 55	First 10 days of Aug to mid 10 days of Aug	20 Sept to first 10 days of Oct (cf. rice)	Last 10 days of Oct to first 10 days of Nov	125 - 150
Single season early-maturing intermediate rice	20 April (or earlier)	120 - 150	20 May (cf. rice)	about 30	First 10 days of June to mid 10 days of June	First 10 days of July	Mid 10 days of August	More than 120
Single season early-maturing intermediate rice	First 10 days of May	120 - 150	First 10 days of June	about 30	Mid 10 days of June to first 10 days of July	First 10 days of Aug to mid 10 days of Aug	Last 10 days of Sept to first 10 days of Oct	140 - 150
Single season late rice	First 10 days of May	120 - 150	First 10 days of June to mid 10 days of June	about 30	Mid 10 days of June to mid 10 days of July	Early to mid Sept	Last 10 days of October	About 140

Table 2-6. Planting Timetable for Oil and Grain Crops

Crop	Seeding Date	Transplanting Date	Heading and Flowering Date	Ripening Date	Growth Period days
Wheat	Around 7 Nov	Around 22 Nov	5 Apr - 20 Apr	Before 6 June	180 - 210
Barley	7 Nov - 22 Nov	--	20 Mar - 5 Apr	5 May - 21 May	160 - 200
Broad beans	23 Oct - 7 Nov	--	Around 20 Mar	Around 21 May - 6 Jun	190 - 220
Peas	23 Oct - 7 Nov	--	Around 20 Mar	21 May - 6 June	190 - 220
Spring corn	5 Apr - 20 Apr	--	Around 21 June	7 July - 23 July	100 - 120
Summer corn	6 Jun - 21 Jun	--	8 Sept - 23 Sept	Around 23 Oct	100 - 120
Autumn corn	23 July - 7 Aug	Around 7 Aug	Before 23 Sept	23 Oct - 7 Nov	About 100
Summer sweet potatoes	Before 5 Apr	5 May - 21 June	About 60 days after transplantation, great increase in blanching with rapid plumping of sweet potatoes	Around 7 Nov	About 210
Autumn sweet potatoes	--	Around 23 Jul - 7 Aug	--	7 Nov	100 - 110
Spring potatoes	19 Feb - 5 Mar	--	--	Around 21 May - 6 Jun	80 - 90
					80 - 100

Table 2-6. Planting Timetable for Oil and Grain Crops

Crop	Sowing Date	Transplanting Date	Heading and Flowering Date	Harvesting Date	Length of growing period days
Wheat	Around 7 Nov	Around 27 Nov	5 Apr - 20 Apr	Before 6 June	190 - 210
Barley	7 Nov - 27 Nov	—	20 Mar - 5 Apr	5 May - 23 May	160 - 200
Broad beans	23 Oct - 7 Nov	—	Around 20 Mar	Around 21 May - 6 June	190 - 220
Peas	23 Oct - 7 Nov	—	Around 20 Mar	21 May - 6 June	190 - 220
Spring corn	5 Apr - 20 Apr	—	Around 21 June	7 July - 23 July	160 - 170
Summer corn	6 Jun - 21 Jun	—	8 Sept - 23 Sept	Around 23 Oct	100 - 120
Autumn corn	23 July - 7 Aug	Around 7 Aug	Before 23 Sept	23 Oct - 7 Nov	About 100
Summer sweet potatoes	Before 5 Apr	5 May - 21 June	About 60 days after transplantation. Great increase in blanching with rapid plumping of sweet potatoes	Around 7 Nov	About 210
Autumn sweet potatoes	—	Around 23 Jul - 7 Aug	—	7 Nov	100 - 110
Spring potatoes	19 Feb - 5 Mar	—	—	Around 23 May - 6 June	80 - 90
Autumn potatoes	23 July - 23 Aug	—	—	Around 7 Nov	80 - 100
Early soybeans	After 20 Apr	—	—	22 Nov - 23 Jul	80 - 90
Summer soybeans	5 May - 21 Jun	—	—	23 Oct - 7 Nov	130 - 150
Autumn soybeans	23 July - 23 Aug	—	Around 23 Aug	7 Nov - 22 Nov	About 100
Mung beans and red beans	After 20 Apr - 23 July	—	8 Sept	23 July - 23 Oct	About 90
Buckwheat	8 Sept	—	23 Sept - 8 Oct	23 Oct - 7 Nov	70 - 80
Shenli rape	23 Sept - 8 Oct	7 Nov - 23 July	Around 5 Apr	Before 6 June	210 - 230
Peas	Around 20 Apr	—	21 May - 21 June	Around 23 Oct	About 180
Sesame	5 May - 6 June	—	Before 7 Aug - 23 Sept	Around 23 Sept	100 - 120
Sunflowers	5 Apr - 5 May	—	Before 7 Aug - 23 Sept	7 Nov	About 200
Chinese milk vetch	23 Sept - 8 Oct	—	Before 5 Apr - 20 Apr	Around 21 May	220 - 240
Alfalfa	23 Oct - 7 Nov	—	5 Apr - 20 Apr	After 21 May	About 200

Table 2-2. Planting Timetable for Economic Crops

Crop	Sowing Date	Transplanting Date	Growth Period	Quantity of Seeds	Harvest Time	Spacing of Plant
Cotton	Growing of seedlings: before 5 Apr vigorous seedling; direct seedling: before 20 Apr vigorous seedling	5 May - 6 Jun	About 140 days	Growing of seedlings: 3 - 4 jin per mu in open field; direct sowing: about 15 jin	Last 10 days of August--end Nov	Equidistant rows: 1.5-1.8 chl x 0.5-0.9 chl. Wide rows: 2.0-2.4 chl; narrow rows 1.2-1.4 chl; plant distance 0.6-0.9 chl
Jute	20 Apr - 5 May	5 May - 6 Jun	About 140 days	Direct sowing: 3 - 5 jin	Stripping of jute bark: first 10 days of Sept - first 10 days of Oct; seed collection: first 10 days of Oct - first 10 days of Nov	Double rows: 8 x 4 x 2.5 - 3 can. Single rows: 6 x 2.5 - 3 can
Tea	7 May - 21 Dec	7 May - 21 Dec	5 Mar - 23 Oct (parental)	15 jin	Spring tea: 5 Apr - 5 May; summer tea: 6 Jun - 21 Jun; autumn tea: 7 Jul - 23 Sept	4 x 1 chl
Sugarcane	5 Mar - 5 Apr	Around 20 Apr	About 270 days	800 - 1000 jin	Nov - Dec	Strip cropping: 2.8 - 3.5 chl x 0.3 - 0.4 chl
Watermelon	Around 5 Apr	20 Apr	90-120 days		7 Jul - 7 Aug	8 chl x 3-4 chl, or 5 chl x 6 chl, with about 300 plants/mu
Muskmelon	Around 5 Apr	After 10 Apr	100-110 days		21 Jun - 7 Aug	5 chl x 2 chl, with about 600 plants/mu
Mat grass	8 Oct - 23 Oct (cuttage)		230-270 days	400 clumps of seedling grass	7 July	0.6 chl x 0.6 chl 0.8 chl x 0.8 chl

I. Characteristics and Uses of Principal Varieties of Paddy Rice

Type	Name of Variety	Parent Pair	Total Period of Vegetative Growth (days)	Principal Characteristics and Uses	Breeding Unit
Early Maturing	Erjiaqing	Erjiutai No 7 x Qingxiangshuzao	107	Rather tall plants; boot leaves quite large; tillering fairly weak; uniform heading; quite large heads; delicate disease resistance. May be grown in green manure fields and in early maturing spring flowering fields. May be paired with late rice crop. High seed setting rate.	Zhejiang Provincial Institute of Agriculture
	Erjiantan No 1	Erjiutai No 7 x Ananzao No 1	105	Compactly shaped plants; medium width leaves; tillering fairly weak; uniform heading; delicate growth; leaf sheaths and tips of apicules purple; low resistance to disease. May be grown in green manure fields and in early maturing spring flowering fields. Fairly weak tolerance of cold; not suitable for extremely early planting.	Henan Provincial Institute of Agriculture, Zhejiang Province.
	Ananzao No 1	Bred from Afjiantane	107	Rather short plants; leaves broad and of deep color; strong tillering; tolerates fertilizer; heading not uniform; tips of apicules purple; susceptible to sheath and culm blight and to blast. Prone to premature degeneration. Frequently planted in green manure fields.	Zhejiang Provincial Institute of Agriculture
Early Maturing	Zhulanai	Late xian /huai x early xian (Liantangzao x Ananzao No 16	103 - 110	Upright leaves; tillering strong; weak cold tolerance; high rate of empty husks; fair resistance to blast. Suitable for planting as early crop in spring flowering fields; seed setting rate normal and output high. Compactness, number of shoots, quantity of fertilizer used, and number of panicles are all greater than Ananzao No 1.	Zhejiang Provincial Institute of Agriculture

Gongqing No 21	Yinbua 191 x Zhaoyang No 1	105	Short plants; strong tillering; high rate of heading; high grain setting rate; good quality rice; delicate disease resistance in final stage. Used as early crop.	Shanghai Municipal Institute of Agriculture County Committee Youth League Seed Farm
Xianzao No 7	Bred from Zhaoyang No 1	105	Rather short plants; strong tillering; uniform heading; fairly strong disease resistance; good changes of color. Used as early crop	Paddy Rice Institute Hunan Provincial Agricultural Academy
Wenge	Bred from Wenzhou	116	Compact plants; thick, sturdy stalks, erect boot leaves; dark green leaves, high grain setting rate; weak tillering; fair resistance to blast; susceptible to culm and sheath disease and to sclerotinia rot. May be grown in green manure fields or in spring flowering fields. In Wenzhou Prefecture, it is continuously cropped over a wide area as a late crop.	Wenzhou Prefectural Institute of Agriculture, Zhejiang.
Ainazao No 39	Bred from Aijiaonante	110 - 115	Quite hard stems; deep leaf color; tolerates fertilizer; strong tillering; high heading rate and high grain setting rate; does not drop grain readily; susceptible to sheath and culm blight during late stage of growth. May be grown either in green manure fields or spring flowering fields.	Zhejiang Provincial Institute of Agriculture
Qingdong No 6	Qingxiao Jinzao x Aidong No 21	100 - 105	Rather compact plants; erect boot leaves; stems coarse and hard; tolerates fertilizer and resists lodging; deep leaf color; large heads; rather high output of polished rice; good quality rice; does not readily drop grains; poor tillering. Too close planting as an early crop in green manure fields to be avoided.	Hangzhou Municipal Institute of Agriculture

Yuanfengzao	Yoz4 No 6 mutant through radiation	103	110	Quite tall stems; rather poor tillering; large heads with numerous grains; rapid heading and coming into milk; does not readily drop grains; susceptible to blast. May be planted in either green manure fields or in spring flowering fields with due care to prevent disease.	Zhejiang Provincial Institute of Agriculture
Zhongganxao	Alou x Zuofeng		111	Compact plants that are quite tall; weak tillering; low fertilizer requirements; green stems become yellow with ripeness; does not readily drop grain; susceptible to rice neck-blast disease. Green in spring flowering fields as early crop. Seedling age resistance high; not prone to early heading.	Zhejiang Provincial Institute of Agriculture
Guangma 70	Guangjie No 9 x Habei No 2	105	110	Tightly compact plants; large heads with numerous grains; tolerates fertilizer and resists lodging; fairly disease resistant; green stems turn brown when ripe; age of seedlings cannot be overly long; give attention to right time for transplanting.	Hangzhou Municipal Institute of Agriculture
Guangfuzao	Guanglun No 4 radiated to form mutant	110	113	Tightly compact plants; quite strong tillering; high grain setting rate; vigorous root system; tolerates fertilizer; subject to dropping of grain. An early rice.	Zhejiang Agriculture College and Zhuli County Institute of Agriculture, Zhejiang Province
Xiangzao No 8	Xiangzao No 2 x Xiangzao No 4		110	Plant height of 75 cms.; medium tillering; luxuriant growth; tips of leaves and apicules purple; even; good changing of color; per thousand grain weight 26 grams. Poor resistance to blast; easily loses grains. Used as early crop.	Paddy Rice Institute, Rural Academy of Agriculture

Shaoan No 1	Bred from Zhenlong No 13 line	105	110	Tightly compact plants; leaves thick and erect; tillering somewhat weak; tolerates fertilizer and resists lodging; high rate of heading; large heads with numerous grains. Per thousand weight of grains is 30 grams. High rate of husked rice output and quality of rice is good. Fairly resistant to blast. Widely adaptable. May be grown in green manure fields, barley fields or late ripening spring blooming fields. Seedling age within 30 days.	Shaoxing Prefectural Institute of Agriculture, Zhejiang Province
Juanyebai	Kezai No 6 kmai fast neutron irradiated	125		Tightly compact plants, straight and erect leaves; deeply colored leaves; moderate tillering; tolerates fertilizer; high rate of grain setting; small grains; fairly resistant to blast; suitable for close planting. Water may not be cut off prematurely during late period of growth.	Paddy and Wheat Insti- tute; Fujian Provincial Academy of Agriculture
Shaotuo No 2	Bred from a natural hybridization of Langfei 313	110	115	Tightly compact plants; broad, erect leaves; moderate tolerance of fertilizer; large heads and numerous grains; glutinous and similar to Jingyin 15; strong cold hardiness; changes color well in late stage; green stems yellowing at maturity; resistant to blast. May be grown as two crops or as early and late crop when three crops are grown. As late crop, output is higher than for Jingyin 15.	Shaoxing Prefectural Institute of Agriculture, Zhejiang
Gufuait No 8	Gufeng 70 x Gufeng 1		115	Fairly tall plants; stems slender and pliable; leaf color somewhat light; moderate tillering; high rate of heading; quite strong resistance to blast; wide adaptability; prone to loose grains. May be planted in green manure fields or in spring flowering fields.	Zhejiang Provincial Academy of Agriculture

Intermediate Maturing Early Xian

Shanghai No. 1	Shanghai No. 1	115	110	Earlier compact plant; fairly broad erect leaves; moderate tillering; moderate fertility needs; high weight per thousand grains; fairly resistant to blast. Chances well with early ripening. Polished rice quality good. Suitable for early season cropping on paddy plains.	Rice and Wheat Institute, Hunan Provincial Academy of Agriculture
Shanghai No. 2	Shanghai No. 2	117	110	Compact plant; thick, hard stems; light green leaf color; weak tillering; large heads; quite high heading rate and fairly settling rate; green awns become yellow when mature, good quality of polished rice. May be planted in green manure fields or spring blooming fields. For spring flowering fields seedling age should be about 30 days.	Shanghai Provincial Agricultural Institute, The Jiangsu Province
Shanghai No. 3	Shanghai No. 3	117	110	Compact plant; leaves fairly green and spread; quite strong tillering; numerous grains; wide adaptability. Very suitable for growth under conditions of moderate fertility or in spring grain fields. It also be double cropped as late rice.	Hunan Provincial Agricultural Institute, The Jiangsu Province
Shanghai No. 4	Shanghai No. 4	118	110	21 cm high, compact plant; leaves straight and dilute. Fairly strong resistance to blast; changes color well; small numbers of empty heads; per thousand weight of grain about 27 grams. Useful as early or late crop. In Shanghai Prefecture should be sown on 5 July.	Paddy Rice Institute, Hunan Provincial Academy of Agriculture
Shanghai No. 5	Shanghai No. 5	118	117	Direct plant; hard stems; leaves thick and dark green; quite weak tillering; green stems turn yellow at maturity; strong resistance to blast. May be grown in conjunction with intermediate maturing varieties. Seedling age should not exceed 17 days. May also be grown as sitting autumn	Shanghai Municipal Institute of Agriculture

Guangdong No. 5	Guangdong No. 6 or other	120	Compact plants; strong pliable stems; dark green stems; strong tillering; well developed root system; tolerates fertilizer; uniform heading; high grain setting rate; strong resistance to disease; green stems yellow at maturity. May be grown in either green manure fields or in spring flowering fields. Currently the main dominant variety. Shows quite high yields when double cropped as late crop.	Guangdong Provincial Academy of Agriculture
Xianfeng No. 1	Lianzhou Guangdong No. 6	120	Compact plants; dark green leaf color; moderate tillering; profuse growth; even heading, high heading rate; economical use of fertilizer; tolerates late planting; widely adaptable; susceptible to rice blast. Very suited to planting in spring blossoming fields; seedling age spread very broad; may be double cropped as late crop.	Zhejiang Provincial Academy of Agriculture
Dongfeng No. 7	Mofeng No. 7 Zhengzhou	122	Moderately bushy plants; thick, hard stems; light colored leaves; strong tillering; well-developed roots; vigorous growth; large heads; disease resistant; tolerates waterlogging; widely adaptable; green stems yellow with maturity; may be planted in green manure fields or spring blossoming fields. Area of spread increasing.	Ningbo County Environ. Institute of Agriculture, Guangdong Province
Zhenlong No. 13	Zhenlong 96 Lanzhou 113	125	Compact shape; weak tillering; large heads; strong fertilizer tolerance; quite strong blast resistance; susceptible to bacterial blight; rapidly comes into milk during late stage; green stems yellow with maturity. May be planted in green manure fields or in spring blossoming fields. Grown quite widely in southern prefectures of Zhejiang Province.	Ningbo Prefectural Institute of Agriculture, Zhejiang
Alibao	Alibao No. 1 Beijing No. 3	112 - 120	Compact plants; strong tillering; leaves deeply colored; uniform heading; fairly strong disease resistance. Used as early crop.	Liaohai Prefecture Institute of Agriculture, Zhejiang Academy

Accession No. 116	Original Name Shan-shan	116 - 127	Large head variety, fairly weak tillering, large heads with numerous grains, comes from early sowing, high grain setting rate; cold hardy and resistant to lodging. Fairly resistant to blast. Some tillering in quite weak, attention should be given, sufficient - dense planting.	The Jiang An School of Agriculture; Zhoubi County, Institute of Agriculture.
Accession No. 117	Original Name Shan-shan	117 - 125	Moderately bushy plants, short, many, many leaves; numerous heads, not sensitive to lodging; fairly high per thousand weight of grain; high quality polished rice, fairly resistant to blast. Seedling age must not be too great, otherwise tillering will be reduced and heads will become small.	Shan-shan School of Agriculture.
Accession No. 118	Original Name Shan-shan	As early rice: 110-115 days; as late rice: about 100 days	Large head variety but not many effective heads; quite high grain setting rate; thick stems; well developed roots; reaches 80 cm in height during late season. Bushy shaped plants; top leaves quite large with the lower 10-20 cm long, leaves being as much as 50 cm long, and the best leaves being about 40 cm long. Quality of polished rice is good with high protein content. Planted as late crop, a seedling age of less than 13 days in heat. Heat will be "close out" seedlings.	Shan-shan County Fine Varieties Farm
Accession No. 119	Bred from Shan-shan 5/ line	125 - 130	Plants about 70 cm tall; stems thin and pliable, light green leaves; strong tillering; quite small heads; per thousand grain weight is 26 to 27 grams; moderate tolerance of fertilizer; thin husks; good quality rice. Suitable for growing in most areas.	Dongfanghong Farm, Shan-shan County, Shan-shan Province
Accession No. 120	Formerly called "Dongfanghong"	125 - 130	Plants about 80 cm tall; stems thin and pliable, light green leaves; medium size heads; no awn; oval grains, tips of awn purple, strong tillering, and moderate fertilizer tolerance. Suitable for double cropping in fertile areas.	Introduced from abroad

Sugeng No 1 (formerly called Guthudhaeng)	Bred from a Hue	About 125 days	About 70 cm tall; stems are coarse and strong; leaves short, wide, and erect; thick leaves with dark color; compact plants; weak tillering; forms milk slowly; weak tolerance of fertilizer and lodging; susceptible to blast. Gradual regression has occurred in this breed; it requires purification and strengthening. Suitable for general planting.	Sarban Prefecture Institute of Agriculture Bangkok Province
"68-1"	Bred from Bangkok	About 145 days as a single crop; about 125 days as a late crop	Moderately high plants; thick, strong, stems; delicate growth; dark green leaves; compact shape; moderate tillering; tolerates fertilizer and resists lodging; disease resistant; good glutinuity. Planted as a late crop. Seedling age should not exceed 18 days. Drooping of grain uncommon. Proper spacing important for development of strong seedlings.	Chiangmai County Fine Varieties Farm
"68-5"	Bred from Bangkok	About 140 days for single crop; about 115 days for late crop	Compact shape and rather tall plants; leaves short and upright with dark green color; quite strong tillering; high heading rate; tolerates fertilizer; resists lodging; blast resistant; resistant to sheath and culm blight. Planted as late crop in double cropping; seedling age about 30 days; suitable for close planting for early development and many heads.	Chiangmai County Fine Varieties Farm
Buzan 19	Bred from Bangkok 58	120	Plants resemble Bangkok 58; leaves long and thin; light leaf color; weak tillering; quite small heads; high grain-setting rate; good quality rice; low fertilizer requirements; fairly strong disease resistance. Fairly well tolerates delayed planting. Some units use it as "close out" seedlings.	Shanghai Municipal Academy of Agriculture

Shanghai 10	Shanghai 10	100	Stems 30-40 cm; leaves 10-15 cm; moderate tillering; moderate high rate of leaf formation; medium size heads; good in fertilizer response; strong disease resistance; not very cold hardy during leaf stages. Moderate need for fertilizer; ripens fairly early; should not be transplanted too late.	Harvested for seed Institute of Agriculture Shanghai Province
Shanghai 11	Shanghai 11	100	Compact plants; thick, strong stems; short, straight leaves dark green in color; moderate tillering; high heading rate; medium size heads; red stripes on back; dark red glumes; tolerant to fertilizer, salinity, and alkalinity; also adaptable; fairly resistant to blast; seedling age should not be too great; requires ample fertilizer and care in breeding.	Shanghai Province Institute of Agriculture
Shanghai 12	Shanghai 12	100	Thin stems; strong tillering; narrow, erect leaves; stems into milk rapidly; plant grain; tolerant late transplanting; resistant to bacterial blight; susceptible to blast; thin in principle; dominant variety of late rice in Shanghai, but less area is now planted to it than formerly because of disease susceptibility.	Harvested for seed Institute of Agriculture Shanghai Province
Shanghai 13	Shanghai 13	100	Stems quite hard; leaves thick and straight; deep green leaf color; moderate tillering; high heading rate; moderate size heads; heads erect; high seed setting rate; strong tolerance of fertilizer; susceptible to rice-neck blast; cold hardy in late stage.	Harvested for seed Institute of Agriculture Shanghai Province

Shaoxing Institute
of Agriculture,
Zhejiang Province

Stems pale, hard, tillering moderate, high heading rate, strong tolerance of fertilizer, somewhat resistant to rice-neck blast and sheath and culm blight. Many units had higher yields than from Nongken No. 6. Strong tolerance of fertilizer; even colonies.

116

Nongken 6

Shaoxing No. 5

Shaoxing County
Fine Varieties
Farm

Fairly compact plants with thin, pliable stems; growth delicate; tillering strong; high heading rate; fairly light leaf color; leaves long and narrow. Angle of bent leaves small; glumes and tips of apiculae are stem yellow. Tolerance of fertilizer and resistance to lodging. Quality of rice good. Size of panicles somewhat small.

120

Bred from
Nongken 19

Shaoxing
No. 1

Shaoxing County
Fine Varieties
Farm

Dark green leaves that are straight. Angle of bent leaves small. Bent leaves slightly shorter than ends of panicles. Delicate growth; tillering strong; heading and grain setting rate high. Tips of apiculae are reddish purple; root system well developed. Tolerates salt and alkali; tolerates fertilizer and resists lodging. Fairly disease resistant. Suitable for close planting of small plants. Needs large amounts of fertilizer. Usually has 20 percent higher yields than Nongken.

145 days as a
single crop;
125 days as
late crop rice

Bred from
a mixture of
rice hybrids

Shaoxing
No. 2

Shaoxing County
Fine Varieties Farm

Thick, sturdy stems; erect bent leaves; delicate plants that are compact. Heads of panicles fairly hard. Thick darkly colored leaves; moderate size heads; high grain setting rate; apiculae tips purple, glumes reddish; fairly strong resistance to rice blast and green withering. As a double crop late rice, leaf age should not exceed 45 days with transplanting taking place at the end of July or early August.

135

Bred from
Nongken 50

Shaoxing
No. 1

Advantageous Nov 7	Bred from Nongkhai 58	125 - 140	Steady, erect stems; long leaves, delicate plants; high grain setting rate; tolerance of fertilizer and resistant to lodging. Glumes, tips of awnless, and stems are yellow. Good quality rice. Tiller- ing poor. Should be suitably close planted and fertilizer applied evenly with a "healthy" application made at the outset.	Pengkalu County Fine Varieties Farm
Advantageous Nov 6	Bred from Nongkhai 57	125 - 140	Thin, soft, and pliable stems; moderate tiller- ing, even growth; leaf color rather light; plants delicate; long leaves long and curled, high seed setting rate; strong resistance to rice blast. Strong cold hardiness as well. Drops grain easily. May be used as a late rice crop or as a "close-out" seedlings.	Pengkalu County Fine Varieties Farm
Planting 13	Bred from Nongkhai 59	165 - 150	Sturdy stems; delicate growth; deep leaf color; large heads; moderate tillering; tolerates fertilizer and resists lodging; fairly strong disease resistance; fairly cold hardy. Seeds should be planted early (around 15 time) for numerous heads.	Hading County Fine Varieties Farm
Planting 455	Bred from Haining 15	135 - 140	Compact plants with sturdy stems. Stem walls sturdy; broad adaptability. Dark green leaves; fairly large heads. Ocular grains in husks; husks thin; tips of awnless purplish red. Glumes yellowish brown inside and outside. As a late crop needs to be planted around 20 June for a leaf age of 65 days with transplanting around 7 August.	Haining Fine Varieties Farm, Haining County

Manong 482	Bred from Manong 14	125 - 140	Thick-culled stems, moderately tall plants; thick hard necks on panicles; panicles droop slightly. Panicle branch stems concentrated. Thin husks with some cracking open; tips of apicules light purplish red; fairly short leaves; which are thick and straight rather than curled. Seeding during last 10 days of June for a late rice crop for a leaf age of 30-40 days.	Roasting Fine Varieties Farm, Hading
Manong 15	Bred from Manong 14	135	Compact plants with sturdy stems. Slightly elongated necks on panicles which are quite hard. Heads slightly arched. Thin husks; light yellow apicule tips; thick dark green leaves; opening angle of boot leaves small. Fairly resistant to rice neck blast disease; fairly strong cold hardness. Sown from 20-25 June for a late rice crop. Leaf age of about 40 days.	Roasting Fine Varieties Farm, Hading
Manong 14	Bred from Houghen 58	140 - 145	Sturdy stems with thick walls. Necks of panicles short and stocky. Heads erect with slight droop. Leaves short and thick, straight and uncurled. Husks thin with some cracking open. Tips of apicules purplish red. For all of the Manong line, the brown rice rate is about 84 percent and the protein content is from 7.6 to 7.8 percent. Seeds sown around 20 June for the late rice crop. Leaf age 40-50 days.	Roasting Superior Varieties Farm, Hading

Hangfeng No. 1	Hangfeng No. 2 a. 10-10-10	1:10	Plants 90 cm tall and rather compact; leaves rather short, erect, and deep green; thick nodes on leaves; compact grains. Used as late crop.	Hangfeng Brigade, Hsichuan Province, Changde City, Hunan Province
Hangfeng No. 2	Hangfeng No. 2 a. 10-10-10	1:15	Plants 90 cm tall; weak tillering; rather large heads; grains not tight; grains large and plump; per thousand grains weight is 40 grams; easily threshed; strong resistance to blight; straw color well. Used as late crop.	Paddy Rice Institute, Hunan Provincial Academy of Agriculture
Hangfeng No. 3	Bred from Hangfeng No. 1	1:15	Tolerant fertilizer; resistant lodging; broad adaptability; high potential for increased yields. Plants about 85 cm tall and bushy; tillering moderate; leaves erect and quite dark in color; colorless apical with short awns. About 87 percent polishing rate; rice of fair quality; seedling age 15-40 days. 250,000-300,000 individual plants per mu.	Hubei Provincial Academy of Agriculture
Nanjing 11	Nanjing No. 5 a. 10-10-10	1:25 1:15	Plants 90-100 cm tall; weak tillering; broad adaptability; large heads with numerous grains; good bumper harvest qualities but not resistant to bacterial blight. Suitable for use as single crop in Central China. May be used as early crop or as final crop in the south.	Nanjing Provincial Institute of Agriculture
Nanjing 11	Bred from single variant plant of Nanjing 57	1:50	Plants about 100 cm tall; tillering not strong; large heads with plump grains; per thousand grain weight is 75 grams; strong resistance to bacterial blight; not cold hardy during blossoming period. Used as intermediate maturing for single crop; may be used for late crop in southern Nanjing and in Zhejiang, but care must be given to sowing on time.	Nanjing Provincial Institute of Agriculture

Nangeng 15	Nongken 51 x Nongken 51	145	Plants from 100-105 cm tall; tillering moderate; large heads; 26-28 grams per thousand grains; resistant to bacterial blight; requires moderate fertilization; lodges easily if over fertilized. Used as intermediate maturing for single crop. May be used as late crop on both shores of lower reaches of Yangtze. About 30 days to correct seedling age.	Jiangsu Provincial Institute of Agriculture
Nangeng 32	Gufubushuang x Nongken 46	145 - 150	Plants about 100-105 cm tall; tillering moderate; large heads; per thousand grain weight is 26 grams; good bumper harvest qualities but not resistant to bacterial blight. May be used as late crop in areas south of Yangtze. Seedling age about 30 days.	Jiangsu Provincial Institute of Agriculture
Nangeng 33	Gufubushuang x Nongken 46	140 - 145	Plants 100 cm tall; moderate tillering; other characteristics similar to Nangeng 32. Tolerates low temperature during blossoming period. Comes into milk quickly. May be used as "closing out seedlings" for late crop. Very strict requirements on seedling age, which may not exceed 30 days in southern Jiangsu Province.	Jiangsu Provincial Institute of Agriculture
Sugeng No. 6	(Nongken 50 x Gufubushuang) x Nongken 50	145 - 150	Plants about 85 cm high; stems thin and pliable; leaves light green; even growth; tolerates fertilizer and resists lodging; strong tillering; numerous heads; rapidly comes into milk. Should be planted early. Suitable for planting in southern Jiangsu.	Suzhou Prefecture Institute of Agriculture, Jiangsu

2. Principal Characteristics and Des. of Wheat Varieties

Variety	Parent Variety	Growth Period and Time of Ripening	Principal Characteristics and Des.	Breeding Unit
Shangshou	1411 x Huashong No. 6	About 190 days End May	Plants about 90-95 cm tall and compact; uniform growth, fairly tolerant of fertilizer, not prone to lodging; grain is oval; long awn; red husk; red grain; weak in wintering; fairly resistant to coldness; moderate tillering. Wide latitude for time of sowing. Somewhat susceptible to stem rust; prone to infection with loose smut and wheat scab. Suitable for close planting with sowing before 21 December best. About 28 jin per mu of seeds required. Requires basic fertility and winter fertilization; suitable for triple cropping and for intercropping with cotton.	Hansen created in Academy of Forestry Chinese Academy of Agriculture
Algenhong		210-230 days First 10 days of May	Plants are about 80 cm tall; heads are club shaped; red husk, oval grains; red seed coverings; semi-glutinous. Young seedlings recumbent; leaves dark green and quite narrow. Winter type. Strong tillering; low head formation rate; heavy wheat scab infestation. Middle 10 days of October to first 10 days of November are best sowing times. Each field requires about 25 jin of seeds. Attention should be given water control, disease prevention, and insect control. Efforts must be continued into late stages of growth to prevent loss of greenness and late ripening. Suitable for intercropping with cotton.	Introduced from abroad.
Zhangshou No. 6	Qinrou x Huashong No. 6	180 - 200 days End May or early June	Plants about 90-100 cm tall; stalks thin and pliable. Heads are spindle shape; long awns, red husk, red grains, small heads; sparsely arranged; fine quality grain. Spring variety but winter damage slight. Tillering moderate; quite high rate of heading. Susceptible to wheat scab; small amount of loose smut. Seeds must be processed before planting with attention to prevention of wheat scab in late stages of growth. Suitable for planting in fields of moderate fertility. High fertility leads to lodging. May be used in three crop system with matched varieties being grown in the wheat stubble.	Former Nanjing Agricultural Academy

Mingma No 3	Radiation of at 1577/506	About 200 days Early May	Spring type. Medium tall plants with large heads; late crop. High yield variety. Long stem; white husk; red grains; rectangular heads; per thousand grain weight of 36-36 grams. In high yield fields, each head may produce about 35 grains. Plants about 90 cm high; small tolerance for damping-off. Rather strong resistance to stem and leaf rust, and to powdery mildew. Moderately susceptible to wheat shrab. Suitable for bumper production on large areas.	Jiangsu Provincial Institute of Agriculture
Mingma No 6	Yunnan 525 x Anhui No 11	190 - 195 days 27-28 May	A spring type quite strong early maturing variety. Long stem, red husk, red grain; spindle shape heads; per thousand grain weight 37 - 40 grams. Plant height about 200 cm; rapid growth of seedlings; young heads develop early; tillering strength rather weak; not very cold resistant. Wheat ear infestations quite serious; moderate susceptibility to stem and leaf rust. Seeds ought not be planted too early; the first 10 days of November are about right. Suitable for planting in medium fertile soil; suitable for use in triple cropping using other varieties.	Jiangsu Provincial Institute of Agriculture
Kuzhou No 15	Kuzhou No 14 x Sulfan Zaobu No 1	220 - 224 days Last 10 days of May	Plants about 110 cm tall with springy stems; per mu yields of less than 600 jin; not prone to lodging. Long stems, white husks; white grain; heads almost rectangular; each head contains 25 grains or more; per thousand weight of grain is over 40 grams. Good quality. Semi-winter variety, with strong tolerance of cold and drought. Resistant to southeasterly dry winds, but poor tolerance for waterlogging. Strongly resistant to stripe rust, to stem rust No 21, insufficient planting [1420 4429], and to loose smut; slightly susceptible to leaf rust, and not resistant to stem rust No 36. Medium-late maturing crop yields 500-600 jin per mu.	Kuzhou Prefecture Institute of Agriculture, Jiangsu

Yangmai No. 11	Hybrid from a later generation	About 215 days End May	7.2	276 days	Large ears; white husk, white grain. Fairly large heads rectangular in shape; sublerm compactly arranged mostly with two grains to each. Per thousand grain weight about 40 grams; good quality. Plants about 100 cm tall; stems rather stout; no lodging when per mu yields are less than 700 jin. Matures 4-5 days earlier than Yangmai. Semi-winter type with good wintering over qualities. Strong resistance to stripe rust and leaf rust, to powdery mildew and long smut. Suitable for planting as a medium late maturing crop for per mu yields of from 500-700 jin.	Yanzhen Prefecture Institute of Agriculture, Huangsu
Yangmai No. 1	Bred from 1114	About 215 days Around 5 June			Compact plants with sturdy stems. Plant height about 90 cm with pronounced waxy coating. Tolerates fertilizer and resists lodging; broad, dark green leaves. Heads are rectangular; white husks with long awns. Moderate tillering and high rate of heading. Quite strong during characterless; resistant to cold but not very resistant to wetness. Susceptible to wheat scab. Slightly susceptible to stem and leaf rust. Best planted around 7 Nov but not much earlier. High fertilizer needs. Suitable for intercropping with cotton.	Yanzhen Prefecture Institute of Agriculture, Huangsu
Yangmai No. 3 (Zachong 3-5-1)	Bred from a later generation natural hybrid of Yangmai No. 1	About 210 days End May			Characteristics similar to Yangmai No. 1; but plant height is 20 cm higher than that of Yangmai No. 1. Output 7 to 20 percent higher than Yangmai No. 1. Spring characteristics strong; slightly susceptible to leaf and stem rust. Medium susceptibility to powdery mildew and to wheat scab. Best planted between 23 October and 7 November. If planted too early, may suffer freeze damage with small quantity maturing of other varieties.	Yanzhen Prefecture Institute of Agriculture, Huangsu
Yangmai No. 3 (Zachong 3-5-1)	Bred from a later generation natural hybrid of Yangmai No. 1	About 210 days End May			Plant height midway between that of Yangmai No. 1 and No. 2. Other characteristics similar to Yangmai No. 1. Strong spring characteristics; starts jointing early; easily damaged by cold and thus it should not be planted too early. Best planted between 23 Oct and 7 Nov. Suited to planting in moderately fertile fields; mildly susceptible to wheat scab, powdery mildew, and rusts. May be part of triple cropping system with other varieties as the crop planted in the preceding season.	Suzhou Prefecture Institute of Agriculture, Huangsu

Sumai No 1	Afu & Tatwan wheat	About 215 days Around 7 June	Compact plants with a height of 85 to 90 cm. Uniform growth; tolerates fertilizer and resists lodging. Heads are flat and conical in shape; long awn; red husks; red grain; not prone to drop grain. Fairly cold resistant; in semi-winter category. Strong tillering; rate of head formation high. Not suited to clone planting or late sowing, which will bring yields of no more than 10 jin per mu. Sowing season quite broad. Almost no change in yields for sowings from end October to end November. Suited to planting in fields of quite high fertility; may be intercropped with cotton.	Suzhou Prefecture Institute of Agriculture, Huangpu
Sumai No. 3	Stater line of Sumai No 1	200-210 days Around 5 June	Plant height about 100-120 cm; moderate tillering strength and moderate tolerance of fertilizer. Heads are spindle shape. Necks of heads arch downward. Other characteristics similar to Sumai No 1. Quantity of seeds planted has to be suitably increased over the amount for Sumai No 1. Quite strong resistance to wheat scab. Excellent fertilization will cause lodging and reduced production. May be intercropped with cotton.	Suzhou Prefecture Institute of Agriculture, Huangpu
Sumai No 1	Bred from Afu	210 days Last 10 days of May	Compact plants with uniform growth. Plants reach about 95 cm in height. Tolerates fertilizer and resists lodging. Long awn; white husk; red grain. Heads are cylindrical; spikelets have large number of grain; leaves dark green and without wax quality. Spring characteristics but cold resistance is poor. Early maturing; resistant to stripe rust and leaf rust. Slightly susceptible to stem rust and wheat scab. Sowing best done during first 10 days of November using 25-30 jin of seeds per mu. High need for fertilizer to prevent paucity when plants are older. Seedling stage cannot be delayed. Suitable for intercropping with cotton.	Wujin County, Huangpu Province
Zhe 918	Linpuzao & Tathe	185 days End May	Plants about 90 cm high. Strong tillering; high heading rate; small heads; no awn; white husk; fairly small grains in egg shape and faintly red. Plumule sheath green; young seedlings partly spread in appearance with light green leaves; moderate fertility needed; prone to drop grain and must be harvested on time. Light wheat scab; susceptible to rust. Strong spring properties. Best planted during first 10 days of Nov. Individual development quite fast. Basic fertility should be sufficient with winter feeding given. Suited to triple cropping system when planted in preceding season. Suited to intercropping with cotton.	Zhejiang Province Agricultural Academy

Q/S	Source # Idali No 17	Within 210 days Around 25 May	Semi-winter-hardy with strong tillering; many heads; large heads; numerous grains; per thousand grainweight of about 38 grams. From 10 to 20 percent higher yields than for Banda 249. Plants about 110 cm high. Poor resistance to lodging. Heads spindle-shaped. Long awn; white husks; white grains. Slight leaf rust and extreme light stem rust. Moderate susceptibility to wheat rust and to loose smut. Moderate period of time till maturity. Seed dormancy period short. Best time for sowing around 23 Oct. Suited for planting in moderately fertile soil.	Shahid Prasadlal Agriculltural Institute
Zhongxin No 1	at 16/2/006 through rust in- sensitive evalua- tion	216 days 5 June	Young seedlings show springiness. Heads rectangular; long awn; white husks; red grains. Plant height about 100 cm; fruiting of blossoms good; weight of grains on a spike is 1 gram. Plants tillering early in spring; resistant to stripe rust; not resis- tant to leaf rust or stem rust. With proper fertility condi- tions, this is a dominant variety that bears upwards of 200 to 300 jin per mu.	Beinan Provincial Agriculltural Institute
Zhongxin 681	Shimo No 1 x Ana	283 days 3 June	Young seedlings show springiness; heads are rectangular; long awn; white husks; red grains. Good quality; per thousand grain weight over 40 grams. Moderate tillering; resistant to stripe rust, stem rust, and leaf rust, which extremely light. When ripe, stems and heads golden yellow. Quite strong resistance to hot, dry winds. Shows prospects for development as a 400-600 jin per mu crop under proper fertilization. Plant- ing of seeds at a rate of 20-22 jin per mu. Planting done during first 10 days of October.	Beinan Provincial Academy of Agriculltural Forestry
Fengzhan No 3	Damot No 1 x Xiang 6028	233 days 3 June	Semi-winter hardy; rectangular heads. Long awn; white husks; white grains; per thousand grain weight around 35 grams; quite good quality. Plants 115 cm tall; intermediate period required till ripening; resistant to stripe rust; slightly susceptible to leaf rust and stem rust. Brought resistance and resistance to hot, dry winds poor. A major variety for extension to areas of moderate fertility for per mu yields of 300-500 jin.	Beihua Academy of Agriculltural

b. Characteristics and Names of Major Varieties of Naked Barley and Barley

Type	Variety	Parent Pair	Total growth Period and Date of Ripening	Major Characteristics and Uses	Source of Seed
Naked Barley	Zaochu 41	Red from Lichang Naked Barley	About 185 days Around 17 May	Plant height about 85 cm, six row heads; yellow heads, medium awns. Young seedlings erect, leaves short, white, not erect with deep color; thick stems. Heads of heads nearly as much off. Good winter heads. Poor tolerance of wetness. Late maturity of tillering; susceptible to cereal rust and requires harvesting on time. May be triple cropped in the crop of preceding year with other varieties.	The Jiangsu Institute of Agriculture
	Zaochu 41	Xianchen Erlong Barley 5 Xianchen Lichang	205 days Around 15 May	Plant height around 90 cm. Thick stems; tolerance for tillering; resistant lodging. No awns. A two-row barley. Moderate tillering; high heading rate; tolerance wetness; fairly resistant to cereal rust and susceptible to covered rust. Best planted during first 10 days of November. Should not be planted deep. Suitable for intercropping with cotton or corn. Has not yet been fully separated.	The Jiangsu Institute of Agriculture
Naked Barley	Zaochu 41	Xianchen Erlong Barley 5 Xianchen Lichang	190 days Around 30 May	Characteristics virtually the same as for Zaochu 41, but plant height is 10 centimeters shorter than Zaochu 41 and heads are also smaller than for Zaochu 41. Yields are higher, but yellow flower leaf disease (7000 500 500 500) is severe. Ripens 3 to 5 days earlier than Zaochu 41. Suitable as a crop preceding corn or cotton.	The Jiangsu Provincial Institute of Agriculture
	The 114	111 x Alibayang	About 190 days Middle 10 days of May	Short stems; strong tillering; high heading rate; uniform heading. Quite strong springness. Yields are highest when sown during early or mid November. Heads are two-row; seedlings are erect; leaf color is deep green; plants compact; poor pliability of stems. Light cereal rust; quite heavy yellow dwarf and mildew disease. Susceptible to powdery mildew. Easily alternated in a three crop system.	The Jiangsu Provincial Institute of Agriculture

Haifan No 1	Bred from Sanyuehuang	About 200 days Middle 10 days of May	Plants about 80 cm tall; short stem; grains short and round; moderate tillering; high heading rate; six row heads. Thick stems; broad, erect leaves with deep green color. Tolerates fertilizer and resistant lodging. At maturity nodes of heads are golden yellow. Susceptible to cereal web and powdery mildew. Suitable for cropping with cotton or as the preceding year's crop in a three crop system.	Xiabai County, Hubei Province Hubei Province
Lixin No 1 (Lixin No 1) Barley	Xigeshan Sanyuehuang (Lixin No 1) Barley	About 200 days Middle 10 days of May	Short plants; stem thin and tawny; compact plants. Young seedlings erect. Tolerates fertilizer and resistant lodging; moderate tillering; high heading rate. Six row heads; long stems; easily broken off. Susceptible to powdery mildew; plume sheath quite short; not suitable for deep planting; should be sown early, usually around the last 10 days of October. Suitable for cropping with corn or cotton, or as the crop of the preceding year in a three crop system.	Daifeng County, Jiangsu Province Jiangsu Province
Lixin No 2	Slater line of Lixin No 1	About 200 days Middle 10 days of May	Similar to Lixin No 1. Plants taller than Lixin No 1 and heads larger. Poor resistance to cereal web and powdery mildew. Matures 4-5 days later than Lixin No 1. Easily intercropped with corn or cotton, or cropped in a three crop system as the crop of the preceding year.	Daifeng County, Jiangsu Province Jiangsu Province
Algaqi		210 days Around 25 May	Compact plants; thick hard stems; tolerates fertilizer; resistant lodging; moderate tillering. Young seedlings semi-erect; slow growth during seedling stage, but growth fast and vigorous once jointing begins. Medium stem; white husk; a six-row naked barley. Susceptible to cereal web, powdery mildew, and green wilt disease [ZND 266] 4016]. Tolerates late sowing; requires larger amounts of fertilizer, but applications must be controlled in late stage to prevent loss of greenness and lodging. Suitable for use as crop of preceding year in three crop system and for intercropping with cotton.	Introduced from abroad

Number
No. 1

Adapted 1900 days
to 10 days
of May

Not earlier and later
adapted

Two rows; tall rice heads; long stems; not too hard; rather hard
and erect; compact plants; stems thin and pliable with springy
ness. Indurated leafy leaves; peduncles lodging. Moderate tiller-
ing; heading rate high. The rachis and the ligule of the lower
leaves are reddish. Induratedness of peduncles and lower
culms are light. Strong springiness, but not suitable for early
cutting. Short growth period and fertilizer application must
be early and adequate. Seeding at rate of 15 lbs per mu. Suf-
ficient for one in three crop system. Yields of more than 800 lbs
per mu in high yield fields.

Adapted

Seed from
Two rows
harvest

About 185 days
to 10 days
of May

Chia County
The Jiang
Province

High plants; two row heads; heads light yellow long heads.
Young seedlings erect; leaves slightly curled and quite
dark in color; moderately thick stems. Root leaves short and
small. Leaf auricles, ligules and stem joints purple; moderate
tolerance of fertilizer. Slight susceptibility to cereal rust.
Suitable in three crop system as a crop of preceding year.

Thousand
No. 12

Thousand
Guangdong
Two rows
Harvesting
No. 12

Around 180 days
to north central
The Jiang.

The Jiang
Agricultural
University

Tall plants with thick hard stems; leaves erect and dark green;
springy; two row heads; springy. Strong tolerance for
fertilizer; stems, and alkalinity. Weak tillering; high
heading rate. Slight susceptibility to barley stripe and
cereal rust; delicate growth; green stems turn yellow upon
ripening; suitable for planting in a three crop system and in
cotton and late producing areas.

Thousand
Guangdong
Two rows

Around 185 days
to north central
The Jiang.
Around 20 May

Introduced
from abroad

Tall plants with hard stems. Tolerant fertilizer and resistant
lodging. Young seedlings erect; leaves deep green. Weak till-
ering; high heading rate. Reasonable; heads yellowish-white;
heads have two rows. Springy. Susceptible to empty head
formation if rains occur during uphilling. Susceptible to
cereal rust; suitable for growth in cotton and late areas.

Thousand
Two rows

Seed from
Adapted

About 200 days
to 20 May

Thousand
Harvesting
Province
County.
Shanghai

Leaves on sprouts are broad and short and erect and dark in
color. Heads have two rows. Heads short and grain compact.
Reasonable. Tiller strong and heading rate high.
Springy. Hard stems. Tolerant fertilizer and resistant
lodging. Susceptible to cereal rust. Suitable for inter-
cropping with cotton or corn.

Shanghai County -
Shanghai

Four row heads; long stem; yellow heads; large heads. Seed-erect seedlings; leaves light in color, tillering weak; heading late; not tolerant of fertilizer; lodges easily, slightly susceptible to cereal rust and covered smut. Suitable in three crop system as crop of preceding year.

Shanghai
Municipal
Academy of
Agriculture

Plants 170 cm tall. Heads with two rows; long stem; yellow heads, which are pointed and purple; heads large and grain numerous. Plants delicate. Dark green leaves; curled back leaves; moderate tillering; strong tolerance of salinity and alkalinity. Resistant to barley stripe; slight susceptibility to cereal rust. Suitable for use in three crop system as preceding year crop.

Yangzhou
Prefecture
Agriculture
Institute -
Jiangsu
Province

Very compact plants. Tolerate fertilizer and resist lodging. Short heads with six rows. Short stem; yellow heads; yellow grain tightly packed. Quite strong tillering; high heading rate. Semi-winter hardy. Erect young seedlings with strong tolerance of cold but poor tolerance of wetness. Early ripening. Susceptible to cereal rust. Suitable for use in a three crop system as crop of preceding year and for late-cropping with cotton.

4. Characteristics and Uses of Major Cotton Varieties

Type	Variety	Parent	Total Growth Period (days)	Major Characteristics and Uses	Breeding Unit
Intermediate Maturing Upland Cotton	Hunan 204	Bred from Bairdian No 15 line	About 125 days	Fairly compact plants of medium height with purple-red main stem, few tufts, and small leaves; cotton bolls are egg shaped. Bolls open easily; single boll of unopened cotton weighs about 5 grams; fiber is 29-30 mm long, and spinning strength is about 40 percent. Early maturing; strong in forming bolls in mid and lower sections. Attention to prevent early degeneration required with prompt picking of the crop and application of fertilizer at time of boll blossoming. Suitable for intercropping with wheat or barley.	Shanghai Municipal Cotton Stock Seed Farm

Daizai No 15	Seed from the hybridization of Kianthe Cotton and First Cotton followed by four back-crossings	150 - 175	Compact plants of medium height, which grow vigorously and have medium large leaves of fairly dark color. Bolls are egg-shaped with round pointed necks. Single bolls weigh about 5 grams and fiber is about 30 mm long. Ginning out-run is 38 to 40 percent. Widely adaptable with strong tolerance for fertilizer, drought, and weevils. Growth somewhat feeble at first, but prolific after budding. Adequate stimulus and strong boll formation.	Introduced from abroad
Racatan 115	Bred from Daizai 15 line	160 - 175	Plants sturdy and compact, and about one-half rib. Shorter than Daizai No 15. Leaves smaller than on Daizai No 15. Bolls weigh about 5 grams; fiber length about 31 mm; ginning out-run about 40 percent. This variety develops early and has strong boll formation. With proper increase in fertilizer levels and proper increase in closeness of planting, spreading season can be made earlier.	Appl-cultured Ping Yantien Propagated Farm, Banchuan County, Shanghai
Jiang-nan No 1	Bred from hybridization of upland and intermediate cotton	About 170 days	Compact plants with medium leaves; leaf color somewhat green during budding season. Growth somewhat weaker than for Daizai No 15 and somewhat more tolerant of fertilizer. Boll bearing branches thin and both boll stems and bolls somewhat elongated. Good boll formation. Single boll unopened weight is 5.5 grams. Boll covering thin; boll opening free and easy; fiber length over 33 mm; ginning out-run 41 percent. Suitable for planting in cotton areas along rivers. Important to apply fertilizer at time of boll flowering to prevent premature degradation. Quick action necessary to prevent damage in dry weather.	Managers Pingnan Chai Institute of Agriculture
613	Bred from Daizai 58-81 line	About 170 days	Fairly compact plants with few tufts on main stalk. Leaves light in color and lacking striations. Single boll weight about 5 grams. Bolls are egg-shaped; bolls quite thin and angular. Bolls open readily and are easy to pick. Out-run fairly stable and this variety shows slow regression. Fiber length about 30 mm and ginning out-run about 40 percent. This variety develops early and ginning out-run about 40 percent. This stages of growth, fertilizer and water must be given on time to prevent premature degeneration. Stems quite soft, so they must be killed up.	Shanghai Municipal Institute of Agriculture

Kuzhou Prefecture, Institute of Agriculture, Jiangsu

Early looking plants of medium height with boll bearing branches striking upward. Medium size leaves of rather dark color arranged in an orderly fashion, and readily penetrated by light. Bolls are oval, and individual bolls weigh 5.9 grams. Fiber length is 31.6 mm; glinning outturn 38.5 percent. Spouts well and boll formation in mid- and lower-sections is strong. Matures early. Application of fertilizer for boll blooming should be given slightly in advance in slightly larger quantities than usual. Stems are soft. They should be killed up early and high.

Shanghai Municipal Institute of Agriculture

Plants dirty and short with small leaves; bolls are oval; boll weight 5.3 grams; fiber length 28-30 mm; glinning outturn 39.41 percent. Early developing with stable growth and strong boll formation, free opening of bolls, and good quality. Suited to close planting. Attention must be given during late stage to fertilizer and water to prevent premature degeneration and to prevent lodging.

Cotton Institute, Chinese Agricultural Academy

Medium size plants that are quite compact and with coarse main stems. Joints closely spaced; not prone to lodging. Fairly numerous tufts. Medium size leaves that develop early and do not degenerate early. Individual boll's weight 5.6 grams. Fiber length is 29-32 mm; glinning outturn is 36-38 percent. Boll husks thin and bolls open freely and are easily picked. Strong tolerance for cold and drought. Fairly sensitive to fertilizer and water during budding period and early blooming period. Quite suited to growth in dry areas. Strong combining powers shown in hybrid breeding and hybrid heterosis utilization. Obvious heterosis.

Shanghai Provincial Cotton Institute

Plants somewhat compact with dark green leaves lacking striations; bolls round and somewhat pointed on end. Boll weight 5.5-6.0 grams. Fiber length about 30 mm. Glinning outturn 38-40 percent. This variety fairly tolerant of fertilizer and water; requires heavy application of fertilizer when flowering. Suitable for planting in sunnier well areas of Yellow River and Yangtze River basins.

130 days

Bred from Kuzhou 58 line (Sizhi 28 line)

Kuzhou 142

116 - 125

Bred from Zhongshan No 3 line

Xizao No 2

About 135 days

Bred from a line of Uganda cotton

Zhongshan No 7

Upland Cotton

Hybrid bred from Shanlian No 3 x Sheshong 52 x Kuzhou 1818 x 60-5

Shan 401

Upland Cotton	Templeton No 5	Bred from Dairfieldian No 15	About 100 days	Rather bushy plants with thick stems that are purplish red and have few tufts. Leaves lack stellations; bolls are short and oval with prominent ridges and depression on ends. Bolls weigh 5.5-6 grams and open easily. Fibers are 29-31 mm long. Ginning output is 40-45 percent. Growth is vigorous during seedling stage, stable to mid stage, and with no degeneration in final stage. Strong resistance. Suitable for growth in Yangtze Basin cotton regions.	Shanghai Provinces Anhui Szechwan Kiangsu
Upland Cotton	Meifan No 1 Cotton	Bred from Jinshan No 1 line	About 110 days	Short, sturdy plants with short joints on stems. Leaves lack deep lines and color is dark green. Cotton bolls elongate with clean ends. Bolls open freely and around same time. Individual boll weight 5.5-6.5 grams; fiber length 28-30 mm, ginning output 47-50 percent. In the lower Yangtze basin, this variety shows early maturation of three or four true leaves, which are squarish. Strong tolerance of fertilizer. Resistant to early degeneration of budding and flowering fertilizer to prevent early degeneration. Suitable for high density planting and for planting with rape.	Shanghai Provinces Anhui Szechwan Kiangsu
Upland Cotton	Meifan No 10	Bred from Meifan line	About 153 days	Rather bushy plants and quite tall. Deep lines lacking on leaves, which are light green in color. Bolls elongated with ends being narrow and pointed. Single boll weight 218 grams. Seeds rather small and dark brown with dark green short down on both ends. Fiber is 36.8 mm long, and ginning output is 30.8 percent. Cotton is white. Sprouts easily but sprouts dislike water and cold weather and are easily susceptible to disease. Roots well developed; growth is vigorous; strongly resistant to drought and alkalinity. Care must be exercised in reasonably close planting of about 3000 plants in moderately fertile soil. Fertilizer needs generally lower than for Dairfield No 15.	Shanghai Provinces Anhui Szechwan Kiangsu

5. Characteristics and Uses of Major Varieties of Rice

Type	Variety	Parent Pair	Growth Period (days)	Major Characteristics and Uses	Breeding Body
→ Early Maturing	Muyou 23	Bred from Shengli rape x descendant of Hanzhongai hybrid	245	Fairly light leaf color; large surface area of leaf; young seedlings semi-erect; plants about 140 cm tall; angular, mostly fruit with fairly large seeds. Application of nitrogenous fertilizer in late stage of growth. Susceptible to sclerotinia rot. Suited to three crop system with paddy rice as preceding crop.	Shanghai Municipal Agricultural Academy
→ Early Maturing	Shanyeh-qing (7055)	Bred from Zhongnong 1097 line	240	Fairly light leaf color. Leaf shape is almost round and resembles a ladle in outer appearance. Plant height is 140-150 cm; stems rather thin and pliable. Light infestation of white rust, downy mildew, and sclerotinia rot. Planting density may be appropriately increased. May be used in triple cropping with paddy rice as the preceding crop.	Shanghai Municipal Agricultural Academy
→ Early Maturing	Shang-you No 1	Bred from a single plant of Chuameng Changjiao	245	Leaves are yellowish green and in the shape of an ellipse with light purple serrated edges. Plants are about 170 cm high and bushy with a waxy powder all over them. Stems are firm and not prone to lodging. Resistant to white rust, powdery mildew, and sclerotinia rot. Suitable for use in triple cropping.	Shanghai County Seed Station
→ Medium Early Maturing	105	Bred from Shengli rape x hybrid descendant of Hanzhongai	About 45 days	Shows strong growth throughout growth period. Not prone to lodging [7559 5181] during the sprouting period. Strong cold hardiness. Dark leaves. The branching leaves are rather long and narrow and there is fairly little early branching or early flowering within a year. Following branching, the stems are thick and strong and not prone to lodging. Moderate tolerance of fertilizer. Mild susceptibility to dragon head disease [783] 7331 40161, and moderate susceptibility to sclerotinia rot. Fair tolerance of weevils and susceptible to virus disease. May be used in triple cropping system with paddy rice being the preceding crop.	Shanghai Municipal Agricultural Academy

Shengli Jing- gong	Collected for breeding from Shengli rape	256	Leaves quite dark, green stems; early poddy covers entire plant. Young apical seed erect. Plants may reach 150-170 cm in height. The [160/1] formation rather dense, and output high. Resistance to diseases and viruses with slight susceptibility to poddy mildew and downy mildew. Incidence of an orthotels not quite high in fields where crop after crop has been grown. Succeeding crops may be single season late rice or seedlings for late crop rice.	Shanghai Municipal Agricultural Academy
Alqi Shengli	Bred from Shengli rape line	255	Leaves dark green, small, and lacking deep incisions. At time of budding, a purple color appears on the main stem at the base of leaf stem only to fade away following blossoming. Plants are short and small, usually about 120 cm tall. Quite strong tolerance of wetness and of fertilizer, and resistant to lodging. Ordinary resistance to diseases. Suitable for planting in two crop system.	Shanghai Municipal Agricultural Academy Shanghai County
Guojing Shengli	Bred from Shengli rape line	About 255 days	During sprouting period, leaves have dark color and are small with thick waxy covering. While wintering over, growth declines. Strong cold hardiness. Slow growth with onset of winter with strong growth in spring. Plants of moderate size with strong branching. Disease infestation light. May be used as crop just preceding planting of late rice seedlings. Because of the strong springtime growth and strong branching of this variety, extra care must be given during the period of branch formation such as plucking the heart of the plant combined with increased application of fertilizer to bring consistently high yields.	Guojing County Huzhou County

6. Characteristics and Uses of Major Varieties of Corn

Type	Variety	Parent Pair	Growth Period (days)	Major Characteristics and Uses	Breeding Unit
Maturing late	Xianjin- huang		120	Plants about 230 cm tall with ears growing as long as about 130 cm stems about 4 cm thick. Cobs are thin with kernels deeply seated. High rate of kernel production. Kernels are hard, orange color, and weigh about 210 grams per thousand. Seeding of the crop around 20 Mar produces an Aug harvest. May be planted as the second crop in a three crop system of two dry crops and one wet one.	Peasant vari- ety from Chongqing County, Shanghai

Wang-shihai	100		Steady plants about 140 cm tall with dark green leaves and large ears. Kernels broad and flat in shape of horse's teeth. Kernels evenly spaced and weigh from 250 to 300 grams per thousand. Kernels white, starchy, and tasty. Planted around 20 March and harvested around end July.	Present variety from Hsiding County, Shanghai
Shanghai No. 2 (2058)	110	9-165 x 110 03	Upright tall plants usually around 230 cm high that are compact in shape with leaves pointing upward. No hair. Grains in yellow and broad and flat like horse's teeth. For thousand weight of grain is about 260 grams and rate of grain output is about 88 percent. Planted at end March, it ripens on 5 August. A medium late maturing variety used in the three crop system of "two dry crops and one wet one" in the Shanghai area.	Shanghai Municipal Agricultural Academy
Shanghai No. 3 (2118)	120	10-20 x 110 02	Compact plants with leaves slightly pointing upward. Well developed root system. Vigorous growth. Strong resistance to water lodging. Kernels are yellow and shaped like horse's teeth. For thousand weight of grain is about 260 grams. Planted during last 10 days of March in the Shanghai area for a harvest around 10 March. Suitable for planting with rape and as a crop that follows harvesting of Chinese cabbage.	Shanghai Municipal Agricultural Academy
Danyao No. 6	About 100	10-20 x 140	Upright tall plants about 250 cm high with vigorous growth, thick stems, and broad leaves. Well-developed root system; large ears, and numerous kernels of grain. Kernels are yellow, broad and flat, and weigh about 100 grams per thousand. Highly resistant to gray leaf spot on large and small leaves. Strong resistance to lodging. Fully long vegetative growth period. Seeds planted direct set 10 days of March ripen around 10 August. Suitable for cropping with rape and for planting following harvest of Chinese cabbage.	Danyao Municipal Academy of Agriculture, Liaoning Province
Zhongdian No. 2	About 120	10-17 x 140	Plants fairly tall, usually around 250 cm. Plant shape compact with vigorous growth. Weight per thousand kernels is about 100 grams. Kernels yellow, broad and flat. Sown during last 10 days of March in the Shanghai area, harvest will occur around 10 August. Suitable for planting with rape or following harvest of Chinese cabbage.	Chinese Academy of Agriculture

Medium Late Maturing

PRODUCTION TEAMS INVEST IN COMMUNE-RUN ENTERPRISES

Chengdu SICHUAN RIBAO in Chinese 4 Jun 80 p 1

[Excerpt] Guanghan County, in its experiment of reforming the organizational system for the management of its commune-managed enterprises, changing the commune-managed enterprises in the entire county from being "state-managed" to being jointly managed by the production brigades, who provide their own capital, has already met with apparent success. In the first quarter of this year, the value of the gross production of all the commune and brigade enterprises of the entire county was 11 million yuan, an increase of 65 percent over the same period last year; the profit realized was 3,280,000 yuan, of which the profit made by commune enterprises was 2,440,000 yuan, 1.8 times greater than that of the same period last year. The initial reform of the managerial system, for the greater development of commune and brigade-run enterprises, initiated an extremely advantageous condition:

THE COMBINED MANAGEMENT OF ENTERPRISES BROUGHT ABOUT THE SELECTION AND UTILIZATION OF AN EXTRA NUMBER OF TALENTED PEOPLE AND PUT AN END TO THE PHENOMENON OF "THREE CONFUSIONS."

In the past, the administration of commune enterprises was, to all intents and purposes, basically "state-run." The production brigades had no right of supervision over their enterprises, and also did not derive any real economic benefit from them. In many enterprises, there existed the phenomenon of the "three confusions"--confusion in leadership, confusion in financial expenditure and confusion in placement of personnel, thus adversely affecting the development of production. Now, commune enterprises are jointly managed by the production brigades, who furnish the capital, forming joint companies. The production brigades, through meetings of representatives of the "stockholders" and management committee meetings, carry out the supervision of the joint companies. The enterprises' operation trend, production planning, financial expenditure, the placement of personnel, methods of reward and punishment and such important questions are determined by meetings of representatives of "stockholders." The operation situation of the enterprise is examined periodically by the management committee. As for the positions of managers and

assistant managers of the communes' joint companies, last winter the management committee, adopting the method of "triple consultation," following the voluntary wish of the individuals concerned and approval by the leaders, hired from county-level organizations and industrial, communication, finance and trade departments 100 persons with economic ability and managerial skills to take on the responsibility. The enterprise's principal and subsidiary factory foremen were also advertised for by the management committee, and the applicants were assigned work commensurate with their abilities. Some enterprises, still following the practice of assigning jobs by examination, by using the method of selecting the best, attracted production personnel. After this kind of reform, the production brigades really became the enterprises' owners; they were extremely concerned with the success or failure of the commune's enterprises, gave more support to them both financially and in terms of labor, and invested over 2 million yuan in capital, alleviating the contradiction of the enterprise's not having enough capital. The commune enterprises' change from being "state-managed" to being under the combined management of the commune has raised democracy to a greater height of development, brought into play the effect of human talent, effectively ended the phenomenon of "three no-fans," and enlivened production, so that the enterprises are prospering more and more all the time. Sanshui Commune's paper factory, according to the opinion of the management committee, reorganized its entire leadership structure and hired a new factory director, and the whole aspect of the place changed very quickly. Last year, the profits of this factory were 25,000 yuan; in the first quarter of this year, they were 17,000 yuan.

9634

CSO: 4007

BRIEFS

LIVESTOCK BREEDING--Xinjiang Uygur Autonomous Region has once again achieved an increase in livestock breeding. At the end of June, the region had succeeded in rearing some 8.35 million head of young stock of various kinds, an increase of some 540,000 head over the same period in 1979. The total number of livestock in the region has reached some 3.1 million head, a 5.2 percent increase over the same 1979 period. Since the beginning of 1979, commune members have been allowed to carry out livestock breeding in each household. As a result, the breeding of livestock for private use has developed quickly. At the end of June, the total number of cattle for private use by commune members in the region accounted for over 40 percent of the total. [OW070147 Beijing Domestic Service in Mandarin 1200 GMT 5 Aug 80]

XINJIANG FARM PRODUCTION--Changji Hui autonomous prefecture in Xinjiang has increased its farm production by growing those varieties of crops most suited to the local conditions. This year a rich harvest has been reaped from 570,000 mu of wheat. The prefecture has 430,000 mu of cash crops, which are all in fine growing condition. [Urumqi Xinjiang Regional Service in Mandarin 1620 GMT 3 Aug 80 OW]

C80: 4007

MEETING HELD ON IMPROVING LIVES OF XIZANG HERDSMAN

OW131601 Beijing XINHUA in English 1533 GMT 13 Aug 80

[Text] Lhasa, August 13 (XINHUA)--Eight county secretaries from the Nagqu prefecture of Northern Tibet met recently to discuss and formulate concrete policies to raise the standard of living of local herdsmen as quickly as possible.

The meeting was called in response to the directive to swiftly put an end to the poor and backward state of Tibet made in May this year by Hu Yaobang, general secretary of the Central Committee of the Chinese Communist Party.

The secretaries decided that first of all greater right in matters of management should be given to the herdsmen, communes, production teams and work groups. They pointed out that government officials are no longer allowed to issue production plans and quotas, or give economic assignments. Production teams, work groups and individuals can arrange production in line with their own need and local conditions.

Nagqu prefecture, a leading animal producer in Tibet, has more than 8 million animals, making up one third of the autonomous region's total.

Other decisions made at the meeting were:

--Any organizational methods and management methods approved by the commune members which help develop production, consolidate the collective economy and improve the people's living standards can be tried out or adopted.

--Every household may keep enough privately-owned animals to meet its needs for milk, butter, wool and hides. The amount of land devoted to peasant's private plots can be increased to 10 percent of the production team's total cultivated land. Certain barren slopes or wasteland may also be given to commune members to grow trees and grass.

--Communes, production teams as well as individuals will be encouraged to engage in fishing, hunting, and collecting medicinal herbs and gathering cow dung for fuel, as long as it does not damage natural resources and collective production. Restaurants and small shops run by families are allowed. Production teams may send craftsmen elsewhere to engage in business.

--Communes and production teams will be encouraged to develop handicrafts. The state will support them with materials, funds and technology so that they can use local resources and produce local specialities and necessities. They will also be allowed to sell or exchange agricultural, animal and side-line products.

--Agricultural and animal husbandry markets will be set up in cities and towns. Fairs will be held at regular intervals to promote economic exchange between cities and countryside.

C.S. 4020

YUNNAN

BRIEFS

RURAL CONFERENCE HELD--The recent Yunnan conference of the secretaries of the county CCP committees throughout the province pointed out that the situation in the countryside is very good. They revealed that grain output throughout the province increased by 12.8 percent over last year, while edible oil increased by 45.7 percent. Procurement of spring grain and edible oil has already been completed. Work on forestry, animal husbandry, sideline production and fishery improved over the corresponding period of last year. Output from fish ponds reached 170,000 tons. This was an increase of 10,000 tons over last year. Arrangement for the masses' livelihood was also done well. Income from financial revenue increased by 5.7 percent over the corresponding period of last year. [HK140431 Kunming Yunnan Provincial Service in Mandarin 1100 GMT 10 Aug 80]

CSO: 4007

CONSTRUCTION OF NEW RURAL VILLAGES IMPROVED

Hangzhou ZHEJIANG RIBAO in Chinese 3 Jun 80 p 1

[Article: "The Peasants' New Villages Are Doing Well--An Investigation Into the Situation of Our Province's [Zhejiang's] Pilot Project in Rural Housing Construction"]

[Text] Our province [Zhejiang] has several tens of communes and brigades which are in the process of developing the work of a pilot project in new socialist rural construction. These communes and brigades are carrying out a unified plan with respect to hilly areas, waterways, cropland, forests, roads and villages, and the construction of new villages has achieved results one can be pleased with. A number of newly resettled peasants, with beaming faces, unanimously praised how good the new villages are.

The communes and brigades engaged in this experiment had three different ways of dealing with the construction of housing and the ownership problems:

Construction by Oneself, With Public Assistance. The new villages are constructed under the unified planning of the brigades (or communes), with the greater portion of the money and materials provided by the commune members themselves, and with the brigades helping with a portion. The right of ownership of the houses would be the commune members'. This method is adopted in Chaoyang Brigade outside of Hangzhou, Yuanpu Commune in Hangzhou city, and Hainde Brigade in Haining. Farm families in Yuanpu Commune generally built two-story houses, each with three units and a floor-space of over 200 square meters. A farm family, aside from making use of old materials, had to contribute between 1500 and 2000 yuan for labor and materials.

Money and Material Provided Jointly by the Collectives and the Commune Members, With Planning, Design and Construction Under the Unified Direction of the Brigades. Under this scheme, there are three different types of property ownership of the houses. In one, the ownership belongs to the collectives, with the brigades returning year by year the amount of

capital contributed by the commune members; in another, it belongs to the commune members, with the commune members returning year by year the portion of the capital contributed by the brigades; in the last, ownership would be shared equally by the collectives and the commune members. In Yunlong Brigade in Haining County, for example, of the capital and materials used to construct a two-story house, that needed for the lower story is taken care of by the production brigade, and ownership belongs to the collective; that for the second story is provided by the commune members, and property ownership is the commune members'.

Construction by the Collective. Planning, provision of capital, design, construction, as well as allocation and management, are under the unified direction of the brigades. The right of ownership is the brigade's, with the commune members paying rent. This method is used by Shangwang Brigade in Jiashan. There are also instances of houses being sold to commune members after being constructed by collectives, as in Chuanbei Brigade in Changxing.

The pilot project's experience clearly indicates three main good points regarding the construction of new villages:

It improved the living conditions of the peasants.

Most of the old-style peasant houses were dark and damp, with people and animals in the same room. Houses in the new villages are bright and dry, comparatively spacious, humans and animals are separated, and [everything is] safe and hygienic.

Public facilities are built with coordination and for the convenience of the commune members.

In the majority of new villages, houses, wells, clinics, shops, schools, nursery schools, etc., are all built with coordination. Qinyong Brigade also uses running water pipes to bring water from the mountains into the village, and has set up public water supply stations where water is supplied free of charge for the commune members' use. Some new villages also have television rooms, newspaper reading rooms, etc., so that the collective activities of the commune members have increased; listening to broadcasts, holding meetings and so forth are all more convenient, thus enriching their cultural life.

It has increased the utilization rate of land. According to statistics of six experimental communes and brigades, construction of villages by unified planning enabled them to make full use of the old village land, hillsides and wasteland; and, when single-story housing was replaced by two-story housing, 899 mu of arable land was conserved.

At present, experimental communes and brigades are still in the minority, province-wide; the majority of local peasants must still build houses on

their own initiative, and they build them very chaotically, with much waste of land. Each area should strengthen its leadership, pool its experience, increase the number of such pilot projects to promote them gradually, and increase the pace of new rural village construction.

9634

CSO: 4007

ZHEJIANG

BRIEFS

TORRENTIAL RAINS REPORTED--Recently torrential rains hit most parts of Zhejiang Province, including Tongxiang, Ninghai, Yin and Deqing counties. The rains caused damage to the early rice crop in these counties. In Tongxiang County, 100,000 mu of rice crop was flattened by heavy rain. Similar damage was reported from other counties. Now measures are being taken to drain excessive water from the fields and to treat the damaged crop in order to minimize the loss. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 6 Aug 80 OW]

ZHEJIANG TERMITE EXTERMINATION METHOD--Hangzhou, 5 Aug--Pest exterminators in Zhuji county, Zhejiang Province, East China, have eliminated 6,000 termite nests in 3 years with poisoned wood. They dramatically reduced the damage to trees in a 530-hectare test area. The "bait" method involves putting wood that has been sprayed with a poisonous powder along the tracks of the termites. Termites become covered with the powder which they carry into the colony. Zhuji county has a total of over 100,000 hectares of forest and two-thirds of its chestnut trees, torrey trees and fir trees were subject to termite damage. The method was evolved by a 49-year old technician Li Peiyao who has studied ways of controlling termites since 1965. [Text] [Beijing XINHUA in English 0717 GMT 5 Aug 80 OW]

ZHEJIANG COUNTY COTTON CROP--Most of the cotton crop in Yuyao county, Zhejiang, are now flowering and bearing bolls. The county has 150,000 mu of cottonfields, second largest in cotton acreage of all counties in the province. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 5 Aug 80]

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